

# Appendix E

## Detailed Evaluation Tables



**TABLE 1: Avonlough Sanitary Sewage Pumping Station (SPS) Siting Alternatives**

<b>Category &amp; Criteria</b>		<b>SPS Alternative 1</b> Adjacent to Existing Station	<b>SPS Alternative 2</b> North side of Easement from Existing Station	<b>SPS Alternative 3</b> East of Susanna Moodie Elementary School	<b>SPS Alternative 4</b> West side of Marshall Road	<b>SPS Alternative 5</b> East side of Avonlough Road and North of Potter Creek
<b>Site Details</b>		<ul style="list-style-type: none"> <li>East side of Avonlough Road, south side of Potter Creek</li> <li>Access would be from Avonlough Road or future subdivision road</li> </ul>	<ul style="list-style-type: none"> <li>Approximately 150 metres east of Avonlough Road, south side of Potter Creek</li> <li>Access would be from Avonlough Road or future subdivision road</li> </ul>	<ul style="list-style-type: none"> <li>Approximately 375 metres east of Avonlough Road, north side of Potter Creek</li> <li>Access would be from Avonlough Road or future subdivision road</li> </ul>	<ul style="list-style-type: none"> <li>West side of Marshall Road, east of Potter Creek</li> <li>Access would be from Marshall Road</li> </ul>	<ul style="list-style-type: none"> <li>East side of Avonlough Road, north side of Potter Creek</li> <li>Access would be from Avonlough Road or future subdivision road</li> </ul>
<b>LAND USE</b>	<b>1. Potential effects on existing or approved/planned land uses</b>	<ul style="list-style-type: none"> <li>Part of Preliminary Draft Plan of Subdivision Application – SPS lands planned within future road allowance and open space.</li> </ul>	<ul style="list-style-type: none"> <li>Part of Preliminary Draft Plan of Subdivision Application – SPS lands planned within future road allowance, development block and open space.</li> </ul>	<ul style="list-style-type: none"> <li>Part of Preliminary Draft Plan of Subdivision Application – SPS potentially displaces single family residential building lots.</li> <li>Proposed draft plan lot/block fabric would have to be amended.</li> </ul>	<ul style="list-style-type: none"> <li>Part of Preliminary Draft Plan of Subdivision Application – SPS potentially displaces planned high density residential.</li> </ul>	<ul style="list-style-type: none"> <li>Part of Preliminary Draft Plan of Subdivision Application – SPS potentially displaces planned high density residential (land owner noted that the higher density block is no longer being considered).</li> </ul>
	<b>2. Potential for conforming with approved local, and provincial plans and policies</b>	<ul style="list-style-type: none"> <li>Located in both the designated Open Space Zone and Environmental Protection area of the LSP.</li> <li>Section 3.5.1 of the LSP states “No development, including the temporary or permanent placing or dumping of material of any kind (whether originating on or off site), shall be permitted within a Floodplain except for flood or erosion control works, shoreline stabilization works, water intake facilities and passive recreational facilities (i.e. trails, boat docking/launching facilities)”.</li> <li>A wetland Environmental Impact Study (EIS) may be required from Quinte Conservation – Section 2 of Ontario Regulation 319/09 states that development is prohibited in or on areas that are subject to flooding, erosion, unstable stream valleys, or where interference in or within 120 m of Provincially Significant Wetlands (PSWs) and 30 m of all other wetlands and site alterations to shorelines and watercourses may result in negative impacts on the hydrologic functions of these sensitive features. Quinte Conservation stated during the November 14, 2019 meeting that setbacks are typically the greater of either 15 m from a flood plain or 30 m from a PSW.</li> <li>SPS is within Quinte Conservation regulation limits and Floodline.</li> </ul>	<ul style="list-style-type: none"> <li>Located primarily in the designated Open Space Zone and partially within the Environmental Protection area of the LSP.</li> <li>Section 3.5.1 of the LSP states “No development, including the temporary or permanent placing or dumping of material of any kind (whether originating on or off site), shall be permitted within a Floodplain except for flood or erosion control works, shoreline stabilization works, water intake facilities and passive recreational facilities (i.e. trails, boat docking/launching facilities)”.</li> <li>A wetland Environmental Impact Study (EIS) may be required from Quinte Conservation – Section 2 of Ontario Regulation 319/09 states that development is prohibited in or on areas that are subject to flooding, erosion, unstable stream valleys, or where interference in or within 120 m of Provincially Significant Wetlands (PSWs) and 30 m of all other wetlands and site alterations to shorelines and watercourses may result in negative impacts on the hydrologic functions of these sensitive features. Quinte Conservation stated during the November 14, 2019 meeting that setbacks are typically the greater of either 15 m from a flood plain or 30 m from a PSW.</li> <li>SPS is within Quinte Conservation regulation limits and partially within the Floodline.</li> </ul>	<ul style="list-style-type: none"> <li>Located in the designated Residential land use of the LSP and adjacent to the designated Environmental Protection area.</li> <li>Section 3.5.1 of the LSP states “Certain secondary uses of land of a non-residential nature may be permitted. Such uses would be restricted to those that are compatible with residential uses and which often perform a service function in support of the residential area within which they are located, or otherwise have such a minor impact that location within residential areas is of little or no consequence.”</li> <li>A wetland Environmental Impact Study (EIS) may be required from Quinte Conservation – Section 2 of Ontario Regulation 319/09 states that development is prohibited in or on areas that are subject to flooding, erosion, unstable stream valleys, or where interference in or within 120 m of Provincially Significant Wetlands (PSWs) and 30 m of all other wetlands and site alterations to shorelines and watercourses may result in negative impacts on the hydrologic functions of these sensitive features. Quinte Conservation stated during the November 14, 2019 meeting that setbacks are typically the greater of either 15 m from a flood plain or 30 m from a PSW.</li> <li>SPS is within Quinte Conservation regulation limits, but outside the Floodline.</li> </ul>	<ul style="list-style-type: none"> <li>Located in low density Residential area of the LSP and adjacent to the designated Environmental Protection area.</li> <li>Section 3.5.1 of the LSP states “Certain secondary uses of land of a non-residential nature may be permitted. Such uses would be restricted to those that are compatible with residential uses and which often perform a service function in support of the residential area within which they are located, or otherwise have such a minor impact that location within residential areas is of little or no consequence.”</li> <li>A wetland Environmental Impact Study (EIS) may be required from Quinte Conservation – Section 2 of Ontario Regulation 319/09 states that development is prohibited in or on areas that are subject to flooding, erosion, unstable stream valleys, or where interference in or within 120 m of Provincially Significant Wetlands (PSWs) and 30 m of all other wetlands and site alterations to shorelines and watercourses may result in negative impacts on the hydrologic functions of these sensitive features. Quinte Conservation stated during the November 14, 2019 meeting that setbacks are typically the greater of either 15 m from a flood plain or 30 m from a PSW.</li> <li>SPS is within Quinte Conservation regulation limits, but outside the Floodline.</li> </ul>	<ul style="list-style-type: none"> <li>Located in low density Residential area of the LSP and adjacent to the designated Environmental Protection area.</li> <li>Section 3.5.1 of the LSP states “Certain secondary uses of land of a non-residential nature may be permitted. Such uses would be restricted to those that are compatible with residential uses and which often perform a service function in support of the residential area within which they are located, or otherwise have such a minor impact that location within residential areas is of little or no consequence.”</li> <li>A wetland Environmental Impact Study (EIS) may be required from Quinte Conservation – Section 2 of Ontario Regulation 319/09 states that development is prohibited in or on areas that are subject to flooding, erosion, unstable stream valleys, or where interference in or within 120 m of Provincially Significant Wetlands (PSWs) and 30 m of all other wetlands and site alterations to shorelines and watercourses may result in negative impacts on the hydrologic functions of these sensitive features. Quinte Conservation stated during the November 14, 2019 meeting that setbacks are typically the greater of either 15 m from a flood plain or 30 m from a PSW. Quinte Conservation confirmed they would not be requesting an EIS as per January 26, 2022 correspondence.</li> <li>SPS is within Quinte Conservation regulation limits, but outside the Floodline.</li> </ul>
	<b>3. Anticipated Site Plan approval and Land Acquisition considerations</b>	<ul style="list-style-type: none"> <li>Potentially difficult Site Plan approvals.</li> <li>Requires realignment of future road.</li> <li>Requires land acquisition (at preliminary draft plan stage).</li> </ul>	<ul style="list-style-type: none"> <li>Potentially difficult Site Plan approvals.</li> <li>Requires realignment of future road.</li> <li>Requires land acquisition (at preliminary draft plan stage).</li> </ul>	<ul style="list-style-type: none"> <li>Anticipated straight forward Site Plan approvals.</li> <li>Requires land acquisition (at preliminary draft plan stage).</li> </ul>	<ul style="list-style-type: none"> <li>Anticipated straight forward Site Plan approvals.</li> <li>Requires land acquisition (at preliminary draft plan stage).</li> </ul>	<ul style="list-style-type: none"> <li>Anticipated straight forward Site Plan approvals.</li> <li>Requires land acquisition (at preliminary draft plan stage).</li> </ul>
<b>Land Use Potential Constraint Ranking</b>	<b>High (Less Preferred)</b>	<b>High (Less Preferred)</b>	<b>Medium (Moderately Preferred)</b>	<b>Medium (Moderately Preferred)</b>	<b>Low (More Preferred)</b>	

**TABLE 1: Avonlough Sanitary Sewage Pumping Station (SPS) Siting Alternatives**

<b>Category &amp; Criteria</b>	<b>SPS Alternative 1</b> Adjacent to Existing Station	<b>SPS Alternative 2</b> North side of Easement from Existing Station	<b>SPS Alternative 3</b> East of Susanna Moodie Elementary School	<b>SPS Alternative 4</b> West side of Marshall Road	<b>SPS Alternative 5</b> East side of Avonlough Road and North of Potter Creek
<b>1. Constructability.</b> <ul style="list-style-type: none"> <li>▪ <b>Depth of station</b></li> <li>▪ <b>Trunk Sanitary Sewer (TSS) trenchless crossing required</b></li> <li>▪ <b>TSS &amp; Forcemain length</b></li> <li>▪ <b>Groundwater conditions</b></li> </ul>	<ul style="list-style-type: none"> <li>▪ Invert of TSS is 79.6 meters.</li> <li>▪ Ground surface at pump station is approximately 87.9 meters.</li> <li>▪ Depth = 87.9 – 79.6 = 8.3 m.</li> <li>▪ Future TSS network requires 12 trenchless crossings.</li> <li>▪ 9148 m of TSS pipe required to service the Potter Creek Drainage Area including the decommissioning of 4 existing stations.</li> <li>▪ 121 m of TSS required to connect exiting station into intersecting TSS on Bridge Street extension traveling to new station.</li> <li>▪ Equal to SPS Alternative 3 for the shallowest proposed station.</li> <li>▪ 880 m long forcemain required to reach Bridge Street/Marshall Road intersection.</li> <li>▪ Engineered fill required to raise the elevation of the station out of the flood plain.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Invert of TSS is 79.4 meters.</li> <li>▪ Ground Surface at pump station is 89 meters.</li> <li>▪ Depth = 89.0 – 79.4 = 9.6 m</li> <li>▪ Future TSS network requires 12 trenchless crossings.</li> <li>▪ 9077 m of TSS pipe required to service the Potter Creek Drainage Area including the decommissioning of 4 existing stations.</li> <li>▪ 151 m of TSS required to connect exiting station into intersecting TSS on Bridge Street extension traveling to new station.</li> <li>▪ 845 m long forcemain required to reach Bridge Street/Marshall Road intersection.</li> <li>▪ Situated within an “island” of a flood plain, not ideal from unknow changes in future flood risks.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Invert of TSS is 79.0 meters.</li> <li>▪ Ground Surface at pump station is 89 meters.</li> <li>▪ Depth = 89.0 – 79.0 = 10 m</li> <li>▪ Future TSS network requires 12 trenchless crossings.</li> <li>▪ 8737 m of TSS pipe required to service the Potter Creek Drainage Area including the decommissioning of 4 existing stations.</li> <li>▪ 321 m of TSS required to connect exiting station into intersecting TSS on Bridge Street extension traveling to new station.</li> <li>▪ Equal to SPS Alternative 1 for the shallowest proposed station.</li> <li>▪ 550 m long forcemain required to reach Bridge Street/Marshall Road Intersection.</li> <li>▪ Good groundwater conditions.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Invert of TSS is 79.5 meters.</li> <li>▪ Ground Surface at pump station is 95 meters.</li> <li>▪ Depth = 95.0 – 79.5 = 15.5 m</li> <li>▪ Future TSS network requires 12 trenchless crossings.</li> <li>▪ 8107 m of TSS pipe required to service the Potter Creek Drainage Area including the decommissioning of 4 existing stations.</li> <li>▪ 958 m of TSS required to connect exiting station into intersecting TSS on Bridge Street extension traveling to new station.</li> <li>▪ Approximately 25% deeper than SPS Alternative 5. Much more bedrock excavation required compared to SPS Alternative 5.</li> <li>▪ 100 m long forcemain required to reach Bridge Street/ Marshall Road intersection.</li> <li>▪ Good groundwater conditions.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Invert of TSS is 79.8 meters.</li> <li>▪ Ground surface at pump station is approximately 88.4 meters.</li> <li>▪ Depth = 88.4 – 79.8 = 8.6 m</li> <li>▪ Future TSS network requires 12 crossings.</li> <li>▪ 9058 m of TSS pipe required to service the Potter Creek Drainage Area including the decommissioning of 4 existing stations.</li> <li>▪ 176 m of TSS required to connect existing pumping station to intersecting manhole on Avonlough Road upstream of the new station.</li> <li>▪ 900 m long forcemain required to reach Bridge Street/ Marshall Road intersection.</li> <li>▪ Good groundwater conditions.</li> <li>▪ Longest overflow pipe length compared to other alternatives for the mitigation of potential overflow impacts.</li> </ul>
<b>2. Impact on operations and maintenance.</b> <ul style="list-style-type: none"> <li>▪ <b>Access to property</b></li> <li>▪ <b>Available utilities</b></li> </ul>	<ul style="list-style-type: none"> <li>▪ Site access via new service road from Avonlough Road, Length = 60m.</li> <li>▪ Existing hydro and water available from Avonlough Rd. Length of the new service = 60m.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Site access via new service road from Avonlough Road, Length = 190m.</li> <li>▪ Site access road would cross lands flooded during a 100 yr storm event, HGL modeling required and 100yr culvert / water crossing required.</li> <li>▪ Existing hydro and water available from Avonlough Rd. Length of new service = 190m.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Temporary site access required if station proceeds to construction in advance of future plan of subdivision. Length of the temporary road = 550m</li> <li>▪ Site is currently not serviced for any municipal utilities. Length of temporary water / hydro would be 550m.</li> <li>▪ In the event the plan of subdivision proceeds at same time as the SPS then no temporary access roads or servicing required.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Site will need to be set back from the road to accommodate possible widening of Marshall Rd.</li> <li>▪ Site access via entrance off of Marshall Road, Length = 20m.</li> <li>▪ Hydro / water available from Marshall Rd, length of new service = 30m.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Site will need to be set back from the road to accommodate possible widening of Avonlough Rd.</li> <li>▪ Existing hydro and water available from Avonlough Rd. Length of the new service = up to 240m.</li> </ul>
<b>3. Future infrastructure coordination opportunities or implementation risks</b>	<ul style="list-style-type: none"> <li>▪ Low level of coordination needed given close proximity of site to the existing Avonlough SPS and Avonlough Road.</li> <li>▪ New SPS is 50m from existing SPS.</li> <li>▪ Higher climate change risks – site is located within the floodplain.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Low level of coordination needed given close proximity of site to the existing Avonlough SPS and Avonlough Road.</li> <li>▪ New SPS is 180m from existing SPS.</li> <li>▪ Higher climate change risks given proximity to floodplain and access road crosses a floodway.</li> </ul>	<ul style="list-style-type: none"> <li>▪ High level of coordination needed with Developers and utilities given site is located in a future draft plan of subdivision.</li> <li>▪ Opportunity to coordinate SPS with planned SWMF and potential water Booster Pumping Station (create 1 Utility Block).</li> <li>▪ Temporary access / utility service connections required if design / construction proceeds in advance of the design and approval of the draft plan of subdivision.</li> <li>▪ New SPS is 460m from existing SPS.</li> <li>▪ Moderate climate change risks given proximity to floodplain.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Moderate level of coordination needed given the new SPS is 715m from the existing SPS.</li> <li>▪ Low climate change risks.</li> <li>▪ Requires coordination with the proposed development.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Low to moderate level of coordination needed given the site is relatively close to the existing Avonlough SPS but requires a trenchless water crossing to connect the existing SPS and need for new entrance off of Avonlough Road.</li> <li>▪ New SPS is 153m from existing SPS.</li> <li>▪ Low climate change risks.</li> <li>▪ Requires coordination with the proposed development.</li> </ul>
<b>4. Flexibility/ability to accommodate future growth beyond 2041.</b> <ul style="list-style-type: none"> <li>▪ <b>Long term connectivity</b></li> <li>▪ <b>Available space for expansion</b></li> </ul>	<ul style="list-style-type: none"> <li>▪ Situated in a central area close to developable lands to the north.</li> <li>▪ Opportunities for expansion on future open space lands to the east.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Situated in a central area close to developable lands to the north.</li> <li>▪ Opportunity for potential expansion on adjacent open space lands.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Situated in a central area close to developable lands to the north.</li> <li>▪ Limited space for expansion due to surrounding future land uses. If land is to be protected for potential future SPS expansion then the time to do so would be at the draft plan of subdivision review phase.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Situated in a central area close to developable lands to the north.</li> <li>▪ Allows for near term development of the lands to the northeast of the site.</li> <li>▪ Opportunity for expansion on lands to the north.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Situated in a central area close to developable lands to the north.</li> <li>▪ Opportunity for expansion on lands to the east.</li> </ul>

TECHNICAL

**TABLE 1: Avonlough Sanitary Sewage Pumping Station (SPS) Siting Alternatives**

<b>Category &amp; Criteria</b>		<b>SPS Alternative 1</b> Adjacent to Existing Station	<b>SPS Alternative 2</b> North side of Easement from Existing Station	<b>SPS Alternative 3</b> East of Susanna Moodie Elementary School	<b>SPS Alternative 4</b> West side of Marshall Road	<b>SPS Alternative 5</b> East side of Avonlough Road and North of Potter Creek
<b>TECHNICAL</b>	<b>5. Implementation timing-ability to meet fast in-service date.</b> <ul style="list-style-type: none"> <li>▪ Near-term connectivity</li> <li>▪ Flow Conveyance from the abandoned Existing Avonlough SPS</li> </ul>	▪ Close proximity to existing station allows for ease of connection.	▪ Close proximity to existing station allows for ease of connection.	▪ Moderate distance from existing station but can be connected reasonably.	▪ Significant distance from the existing station and would require notable effort to divert existing flows.	▪ Close proximity to existing station allows for ease of connection.
	<b>6. Traffic impacts during construction, including expected lane/sidewalk closures and disruption to public transit</b>	▪ Potential traffic impacts as this alternative requires trenchless water crossing on Avonlough Road.	▪ None Anticipated.	▪ None Anticipated.	▪ None Anticipated.	▪ None Anticipated.
	<b>Technical Potential Constraint Ranking</b>	<b>Medium (Moderately Preferred)</b>	<b>Medium (Moderately Preferred)</b>	<b>High (Less Preferred)</b>	<b>Medium (Moderately Preferred)</b>	<b>Low (More Preferred)</b>

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NATURAL ENVIRONMENT	1. Potential effects on terrestrial/aquatic habitat and species	<p><b>Terrestrial Environment</b></p> <ul style="list-style-type: none"> <li>▪ There are no Areas of Natural Scientific Interest (ANSIs) within 120 m of the SPS alternative.</li> <li>▪ A significant woodland is present within 120 m of the alternative but is not anticipated to be affected as its located west of Avonlough Road.</li> <li>▪ The Potter Creek Locally Significant Wetland ((LSW), but treated as a Provincially Significant Wetland (PSW)) and an Environmental Protection Area are located within 120 m of the SPS alternative that may be affected by vegetation removal, dewatering activities, sedimentation and erosion and soil and water contamination. Alternative 1 is located within the Pottery Creek Tributary LSW.</li> <li>▪ The majority of SPS Alternative 1 footprint contains a deciduous forest (FOD) with a small portion of a cultural meadow (CUM) that will require vegetation removal of 0.30 ha and 0.05 ha, respectively.</li> <li>▪ There are 11 candidate Significant Wildlife Habitat (SWH) potentially occurring within 120 m of this alternative, including habitat for 12 Species of Conservation Concern (SOCC); SOCC are not protected under the provincial Endangered Species Act (ESA) but receive protection from the 2014 Provincial Policy Statement (PPS) and other planning documents.</li> <li>▪ Wildlife, including bats, <i>Migratory Bird Convention Act</i>, 1994 (MBCA) protected breeding birds and Species of Conservation Concern (SOCC) will be affected by vegetation removal via habitat loss and potential displacement or disturbance. Sensitive wildlife restrictive timing for vegetation/tree removal will apply, such as outside of the breeding bird season (April 1 to August 31) and bat active season (March 30 to October 1), as well as dewatering activities outside of turtle hibernation season (October 15 to April 15) and installation of reptile exclusion fencing.</li> </ul> <p><b>Aquatic Environment</b></p> <ul style="list-style-type: none"> <li>▪ SPS Alternative 1 is located within Quinte Conservation(QC) Regulation Limits.</li> <li>▪ SPS Alternative 1 does not overlap fish habitat; however, work is proposed within the floodplain of the Potter Creek Tributary. Work near water could potentially indirectly impact fish and fish habitat via the following: <ul style="list-style-type: none"> <li>○ Potential changes in sediment and / or contaminant concentrations in the event of the release of sediment and / or deleterious substances to the watercourse.</li> <li>○ Potential changes to habitat structure, instream and / or canopy cover as a result of the removal and / or alteration of riparian vegetation, and the placement of fill below the HWM.</li> <li>○ Potential for changes in baseflow or water temperatures as a result of alterations of groundwater flows to surface water and / or changes in slope or drainage.</li> </ul> </li> </ul>	<p><b>Terrestrial Environment</b></p> <ul style="list-style-type: none"> <li>▪ There are no ANSIs or significant woodlands within 120 m of the SPS alternative.</li> <li>▪ SPS Alternative 2 footprint is immediately adjacent and/or overlapping with the Potter Creek LSW (treated as PSW) and an Environmental Protection Area that may be affected by vegetation removal, dewatering activities, sedimentation and erosion and soil and water contamination.</li> <li>▪ The majority of the SPS Alternative 2 footprint contains a cultural meadow (CUM) and portions of a Deciduous Swamp (SWD) that will require vegetation removal of 0.31 ha and 0.05 ha respectively.</li> <li>▪ There are 11 candidate SWH potentially occurring within 120 m of this alternative, including habitat for 12 SOCC; SOCC are not protected under the provincial ESA but receive protection from the PPS and other planning documents.</li> <li>▪ Wildlife, including bats, MBCA protected breeding birds and SOCC will be affected by vegetation removal via habitat loss and potential displacement or disturbance. Sensitive wildlife restrictive timing for vegetation/tree removal will apply, such as outside of the breeding bird season (April 1 to August 31) and bat active season (March 30 to October 1), as well as dewatering activities outside of turtle hibernation season (October 15 to April 15) and installation of reptile exclusion fencing.</li> </ul> <p><b>Aquatic Environment</b></p> <ul style="list-style-type: none"> <li>▪ SPS Alternative 2 is located within QC Regulation Limits.</li> <li>▪ SPS Alternative 2 overlaps direct fish habitat. Work near water could potentially impact fish and fish habitat via the following: <ul style="list-style-type: none"> <li>○ Potential changes in sediment and / or contaminant concentrations in the event of the release of sediment and / or deleterious substances to the watercourse. Changes to stream dynamics and morphology could also increase erosion potential and result in changes to sediment concentrations.</li> <li>○ Potential changes to habitat structure, instream and / or canopy cover as a result of the removal and / or alteration of riparian vegetation, and the placement of fill below the HWM.</li> <li>○ Potential for changes in baseflow or water temperatures as a result of alterations of groundwater flows to surface water and / or changes in slope or drainage.</li> </ul> </li> </ul>	<p><b>Terrestrial Environment</b></p> <ul style="list-style-type: none"> <li>▪ There are no ANSIs or significant woodlands within 120 m of the alternative.</li> <li>▪ within 120 m of the alternative.</li> <li>▪ SPS Alternative 3 footprint is immediately adjacent to the Potter Creek LSW (treated as PSW) and an Environmental Protection Area that may be affected by vegetation removal, dewatering activities, sedimentation and erosion and soil and water contamination. Alternative 3 is located within an unevaluated wetland associated with Pottery Creek Tributary LSW.</li> <li>▪ Least preferred alternative due to the most tree removal. SPS Alternative 3 footprint is contained entirely within a Deciduous Forest (FOD) that will require vegetation removal of 0.36 ha.</li> <li>▪ There are 11 candidate SWH potentially occurring within 120 m of this alternative, including habitat for 12 SOCC; SOCC are not protected under the provincial ESA but receive protection from the PPS and other planning documents.</li> <li>▪ Wildlife, including bats, MBCA protected breeding birds and SOCC will be affected by vegetation removal via habitat loss and potential displacement or disturbance. Sensitive wildlife restrictive timing for vegetation/tree removal will apply, such as outside of the breeding bird season (April 1 to August 31) and bat active season (March 30 to October 1), as well as dewatering activities outside of turtle hibernation season (October 15 to April 15) and installation of reptile exclusion fencing.</li> </ul> <p><b>Aquatic Environment</b></p> <ul style="list-style-type: none"> <li>▪ SPS Alternative 3 is located within QC Regulation Limits.</li> <li>▪ SPS Alternative 3 does not overlap fish habitat; however, work near water could potentially indirectly impact fish and fish habitat via the following: <ul style="list-style-type: none"> <li>○ Potential changes in sediment and / or contaminant concentrations in the event of the release of sediment and / or deleterious substances to the watercourse</li> <li>○ Potential changes to habitat structure, instream and / or canopy cover as a result of the removal and / or alteration of riparian vegetation.</li> <li>○ Potential for changes in baseflow or water temperatures as a result of alterations of groundwater flows to surface water and / or changes in slope or drainage.</li> <li>○ Potential changes in food and / or nutrient concentrations as a result of the removal and / or alteration of riparian vegetation.</li> </ul> </li> </ul>	<p><b>Terrestrial Environment</b></p> <ul style="list-style-type: none"> <li>▪ There are no ANSIs or significant woodlands within 120 m of the alternative.</li> <li>▪ SPS Alternative 4 footprint is approximately 40 m away from the Potter Creek LSW (treated as PSW) and an Environmental Protection Area but within approximately 5 m of an unevaluated wetland that may be affected by vegetation removal, dewatering activities, sedimentation and erosion and soil and water contamination.</li> <li>▪ SPS Alternative 4 footprint is contained entirely within a cultural meadow /cultural thicket which will require 0.36 ha of scrub-successional vegetation removal.</li> <li>▪ There are 11 candidate SWH potentially occurring within 120 m of this alternative, including habitat for 12 SOCC; SOCC are not protected under the provincial ESA but receive protection from the PPS and other planning documents.</li> <li>▪ Wildlife, including MBCA protected breeding birds will be affected by vegetation removal via habitat loss and potential displacement or disturbance. Sensitive wildlife restrictive timing for vegetation/tree removal will apply, such as outside of the breeding bird season (April 1 to August 31), as well as installation of reptile exclusion fencing.</li> </ul> <p><b>Aquatic Environment</b></p> <ul style="list-style-type: none"> <li>▪ SPS Alternative 4 is located within QC Regulation Limits.</li> <li>▪ SPS Alternative 4 does not overlap fish habitat; however, work near water could potentially indirectly impact fish and fish habitat via the following: <ul style="list-style-type: none"> <li>○ Potential changes in sediment and / or contaminant concentrations in the event of the release of sediment and / or deleterious substances to the watercourse.</li> <li>○ Potential changes to habitat structure, instream and / or canopy cover as a result of the removal and / or alteration of riparian vegetation.</li> <li>○ Potential for changes in baseflow or water temperatures as a result of alterations of groundwater flows to surface water and / or changes in slope or drainage.</li> <li>○ Potential changes in food and / or nutrient concentrations as a result of the removal and / or alteration of riparian vegetation.</li> </ul> </li> </ul> <p><i>Note: Although SPS Alternative 5 is anticipated to have the least amount of vegetation removal, SPS Alternative 4 is preferred when combined with Forcemain /Gravity Sewer Alignment 4 (refer to Table 2).</i></p>	<p><b>Terrestrial Environment</b></p> <ul style="list-style-type: none"> <li>▪ There are no ANSIs, significant woodland, PSWs or environmentally significant areas within 120 m of the alternative.</li> <li>▪ A significant woodland is present within 120 m of the alternative but is not anticipated to be affected as its located west of Avonlough Road.</li> <li>▪ SPS Alternative 5 footprint is located within 120m of the Potter Creek LSW and an Environmental Protection Area that may be affected by vegetation removal, dewatering activities, sedimentation and erosion and soil and water contamination. Alternative 5 is located outside of the wetland boundaries but a portion of Alternative 5 is located within 30 m of an unevaluated wetland associated with the Pottery Creek Tributary LSW.</li> <li>▪ Most preferred alternative, as the majority of the footprint is located within an agricultural field with minimal vegetation removal (0.11 ha) limited to the Cultural Hedgerow.</li> <li>▪ There are 11 candidate SWH potentially occurring within 120 m of this alternative, including habitat for 12 SOCC; SOCC are not protected under the provincial ESA but receive protection from the PPS and other planning documents.</li> <li>▪ Wildlife, including bats and MBCA protected breeding birds will be affected by vegetation removal via habitat loss and potential displacement or disturbance. Sensitive wildlife restrictive timing for vegetation/tree removal will apply, such as outside of the breeding bird season (April 1 to August 31) and bat active season (March 30 to October 1), as well as installation of reptile exclusion fencing.</li> </ul> <p><b>Aquatic Environment</b></p> <ul style="list-style-type: none"> <li>▪ SPS Alternative 5 is located within QC Regulation Limits.</li> <li>▪ SPS Alternative 5 does not overlap fish habitat; however, work near water could potentially indirectly impact fish and fish habitat via the following: <ul style="list-style-type: none"> <li>○ Potential changes in sediment and / or contaminant concentrations in the event of the release of sediment and / or deleterious substances to the watercourse.</li> <li>○ Potential changes to habitat structure, instream and / or canopy cover as a result of the removal and / or alteration of riparian vegetation.</li> <li>○ Potential for changes in baseflow or water temperatures as a result of alterations of groundwater flows to surface water and / or changes in slope or drainage.</li> <li>○ Potential changes in food and / or nutrient concentrations as a result</li> </ul> </li> </ul>
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**TABLE 1: Avonlough Sanitary Sewage Pumping Station (SPS) Siting Alternatives**

Category & Criteria	SPS Alternative 1 Adjacent to Existing Station	SPS Alternative 2 North side of Easement from Existing Station	SPS Alternative 3 East of Susanna Moodie Elementary School	SPS Alternative 4 West side of Marshall Road	SPS Alternative 5 East side of Avonlough Road and North of Potter Creek
<b>NATURAL ENVIRONMENT</b>	<p>cover as a result of the removal and / or alteration of riparian vegetation.</p> <ul style="list-style-type: none"> <li>Potential for changes in baseflow or water temperatures as a result of alterations of groundwater flows to surface water and / or changes in slope or drainage.</li> <li>Potential changes in food and / or nutrient concentrations as a result of the removal and / or alteration of riparian vegetation.</li> </ul>	<ul style="list-style-type: none"> <li>Potential changes in food and / or nutrient concentrations as a result of the removal and / or alteration of riparian vegetation.</li> <li>Potential change in channel or shoreline morphology as a result of the encroachment of permanent infrastructure into the aquatic environment.</li> <li>Potential changes in substrate composition that could alter key habitat features such as food, nutrient supply and existing habitat structure and cover.</li> <li>Potential mortality of fish as a result of work below the HWM.</li> </ul>			<p>of the removal and / or alteration of riparian vegetation.</p>
	<p><b>2. Potential effects on Species at Risk (SAR) and their habitat</b></p> <p><b>Terrestrial Environment</b></p> <ul style="list-style-type: none"> <li>The following terrestrial SAR and their habitat may potentially occur in or within 120 m of the SPS Alternative 1 based on identified ELC from aerial photo interpretation: <ul style="list-style-type: none"> <li>Threatened (THR): 3 (Bobolink*, Eastern Meadowlark* and Blanding's Turtle*)</li> <li>Endangered (END): 7 (Loggerhead Shrike, Pale-bellied Frost Lichen, Little Brown Myotis, Eastern Small-footed Myotis, Northern Myotis, Tri-colored Bat, and Butternut*).</li> </ul> </li> </ul> <p><b>Aquatic Environment</b></p> <ul style="list-style-type: none"> <li>Although SPS Alternative 1 does not overlap fish habitat, work near water could potentially result in effects (listed above) to fish and fish habitat without the application of mitigation and protection measures.</li> </ul> <p>* Species has potential of occurring within 120 m but outside of the SPS Siting Alternative based on presence of suitable habitat identified through aerial photo interpretation</p>	<p><b>Terrestrial Environment</b></p> <ul style="list-style-type: none"> <li>The following SAR and their habitat may potentially occur in or within 120 m of the SPS Alternative 2 based on identified ELC from aerial photo interpretation: <ul style="list-style-type: none"> <li>THR: 3 (Bobolink*, Eastern Meadowlark*, and Blanding's Turtle)</li> <li>END: 7 (Loggerhead Shrike, Pale-bellied Frost Lichen, Little Brown Myotis, Eastern Small-footed Myotis, Northern Myotis, Tri-colored Bat and Butternut*).</li> </ul> </li> </ul> <p><b>Aquatic Environment</b></p> <ul style="list-style-type: none"> <li>Work near and below the HWM could potentially result in effects (listed above) to fish and fish habitat without the application of mitigation and protection measures.</li> </ul> <p>* Species has potential of occurring within 120 m but outside of the SPS Siting Alternative based on presence of suitable habitat identified through aerial photo interpretation</p>	<p><b>Terrestrial Environment</b></p> <ul style="list-style-type: none"> <li>Least preferred due to the most tree removal. The following SAR and their habitat may potentially occur in or within 120 m of the SPS Alternative 3 based on identified ELC from aerial photo interpretation: <ul style="list-style-type: none"> <li>THR: 4 (Bobolink*, Eastern Meadowlark*, Least Bittern*, and Blanding's Turtle*)</li> <li>END: 7 (Loggerhead Shrike*, Pale-bellied Frost Lichen, Little Brown Myotis, Eastern Small-footed Myotis, Northern Myotis, Tri-colored Bat and Butternut).</li> </ul> </li> </ul> <p><b>Aquatic Environment</b></p> <ul style="list-style-type: none"> <li>Although SPS Alternative 3 does not overlap fish habitat, work near water could potentially result in effects (listed above) to fish and fish habitat without the application of mitigation and protection measures.</li> </ul> <p>* Species has potential of occurring within 120 m but outside of the SPS Siting Alternative based on presence of suitable habitat identified through aerial photo interpretation</p>	<p><b>Terrestrial Environment</b></p> <ul style="list-style-type: none"> <li>The following SAR and their habitat may potentially occur in or within 120 m of the SPS Alternative 4 based on identified ELC from aerial photo interpretation: <ul style="list-style-type: none"> <li>THR: 5 (Barn Swallow*, Bobolink, Chimney Swift*, Eastern Meadowlark, and Blanding's Turtle*)</li> <li>END: 7 (Loggerhead Shrike, Pale-bellied Frost Lichen*, Little Brown Myotis*, Eastern Small-footed Myotis*, Northern Myotis*, Tri-coloured Bat*, and Butternut*).</li> </ul> </li> </ul> <p><b>Aquatic Environment</b></p> <ul style="list-style-type: none"> <li>Although SPS Alternative 4 does not overlap fish habitat, work near water could potentially result in effects (listed above) to fish and fish habitat without the application of mitigation and protection measures.</li> </ul> <p>* Species has potential of occurring within 120 m but outside of the SPS Siting Alternative based on presence of suitable habitat identified through aerial photo interpretation</p> <p><i>Note: Although SPS Alternative 5 is anticipated to have the least amount of vegetation removal, Alternative 4 is preferred when combined with Forcemain /Gravity Sewer Alignment 4 (refer to Table 2).</i></p>	<p><b>Terrestrial Environment</b></p> <ul style="list-style-type: none"> <li>Most preferred. The following SAR and their habitat may potentially occur in or within 120 m of the SPS Alternative 5 based on identified ELC from aerial photo interpretation: <ul style="list-style-type: none"> <li>THR: 4 ( Bobolink, Eastern Meadowlark, Barn Swallow*, Blanding's Turtle*)</li> <li>END: 7 (Loggerhead Shrike*, Pale-bellied Frost Lichen, Little Brown Myotis, Eastern Small-footed Myotis, Northern Myotis, Tri-colored Bat and Butternut).</li> </ul> </li> </ul> <p><b>Aquatic Environment</b></p> <ul style="list-style-type: none"> <li>Although SPS Alternative 5 does not overlap fish habitat, work near water could potentially result in effects (listed above) to fish and fish habitat without the application of mitigation and protection measures.</li> </ul> <p>* Species has potential of occurring within 120 m but outside of the SPS Siting Alternative based on presence of suitable habitat identified through aerial photo interpretation</p>
	<p><b>3. Potential effects on surface and groundwater</b></p> <ul style="list-style-type: none"> <li>Located within the Potter Creek Floodline.</li> <li>Close proximity to Potter Creek including south tributary – SPS essentially located on an island and could be subject to fluvial geomorphological process.</li> <li>Anticipated Dewatering</li> <li>Located within limits of Highly Vulnerable Aquifer and Intake Protection Zone 3.</li> </ul>	<ul style="list-style-type: none"> <li>Partially located within the Potter Creek Floodline.</li> <li>Close proximity to Potter Creek</li> <li>Anticipated Dewatering</li> <li>Located within limits of Highly Vulnerable Aquifer and Intake Protection Zone 3.</li> </ul>	<ul style="list-style-type: none"> <li>Located outside the Potter Creek Floodline.</li> <li>Close proximity to Potter Creek</li> <li>Anticipated Dewatering</li> <li>Located within limits of Highly Vulnerable Aquifer and Intake Protection Zone 3.</li> </ul>	<ul style="list-style-type: none"> <li>Located outside the Potter Creek Floodline.</li> <li>Close proximity to Potter Creek</li> <li>Less anticipated Dewatering compared to SPS Alternatives 1,2, and 3.</li> <li>Located within limits of Highly Vulnerable Aquifer and Intake Protection Zone 3.</li> </ul>	<ul style="list-style-type: none"> <li>Located outside the Potter Creek Floodline.</li> <li>Close proximity to PotterCreek</li> <li>Less anticipated Dewatering compared to SPS Alternatives 1,2, and 3.</li> <li>Located within limits of Highly Vulnerable Aquifer and Intake Protection Zone 3.</li> </ul>
	<p><b>4. Potential to encounter soil and water contamination</b></p> <ul style="list-style-type: none"> <li>Low potential to encounter soil and water contamination.</li> </ul>	<ul style="list-style-type: none"> <li>Low potential to encounter soil and water contamination.</li> </ul>	<ul style="list-style-type: none"> <li>Low potential to encounter soil and water contamination.</li> </ul>	<ul style="list-style-type: none"> <li>Low potential to encounter soil and water contamination.</li> </ul>	<ul style="list-style-type: none"> <li>Low potential to encounter soil and water contamination.</li> </ul>

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Category & Criteria		SPS Alternative 1 Adjacent to Existing Station	SPS Alternative 2 North side of Easement from Existing Station	SPS Alternative 3 East of Susanna Moodie Elementary School	SPS Alternative 4 West side of Marshall Road	SPS Alternative 5 East side of Avonlough Road and North of Potter Creek
NATURAL ENVIRONMENT	5. Anticipated environmental permitting and approval considerations	<ul style="list-style-type: none"> <li>Potentially more difficult. Quinte Conservation Authority approvals related to siting SPS between Potter Creek and tributary within the Flood Plain.</li> <li>Authorization under the <i>Endangered Species Act, 2007</i> (ESA) may be required for potential SAR identified above, but especially for tree removal within bat SAR habitat (FOD).</li> <li>DFO Request for Review / Authorization may be required if activities near the High Water Mark (HWM) could result in impacts to fish or fish habitat.</li> <li>Permit application under O.Reg. 319/09 for interference with wetlands and watercourses. A wetland Environmental Impact Study (EIS) may be required from Quinte Conservation in support of the permit application under O.Reg. 319/09.</li> <li>SPS footprint is within Quinte Conservation Regulation limits and overlaps the Potter Creek Tributary LSW (treated as PSW), which may require approval from the Quinte Conservation Board.</li> <li>Based on correspondence received from MNRF on October 21, 2019, MNRF highly recommends evaluating the unevaluated wetlands surrounding Potter Creek LSW and confirming the boundaries of the existing LSW as per the Ontario Wetland Evaluation System; this can be completed during detailed design.</li> <li>Groundwater – dewatering and/or depressurization requirements and anticipated water flow volumes will be confirmed by geotechnical investigations completed in support of detailed design. The determination of which process should be followed (Permit to Take Water (PTTW) or Environmental Activity Sector Registry (EASR)) is based on the expected volume of taking during dewatering; takings between 50,000 L/d and 400,000 L/d are required to register for the EASR while takings above 400,000 L/d are regulated by the PTTW process. If significant dewatering is anticipated, a detailed groundwater management and monitoring plan will be required in support of the dewatering activities.</li> </ul>	<ul style="list-style-type: none"> <li>Authorization under the <i>Endangered Species Act, 2007</i> (ESA) may be required for potential SAR identified above, but especially for tree removal within bat SAR habitat (SWD).</li> <li>DFO Request for Review / Authorization may be required if activities near or below the HWM could result in impacts to fish or fish habitat.</li> <li>Permit application under O.Reg. 319/09 for interference with wetlands and watercourses. A wetland Environmental Impact Study (EIS) may be required from Quinte Conservation in support of the permit application under O.Reg. 319/09.</li> <li>SPS footprint is within Quinte Conservation Regulation limits and overlaps the Potter Creek Tributary LSW (treated as PSW), which may require approval from the Quinte Conservation Board.</li> <li>Based on correspondence received from MNRF on October 21, 2019, MNRF highly recommends evaluating the unevaluated wetlands surrounding Potter Creek LSW and confirming the boundaries of the existing LSW as per the Ontario Wetland Evaluation System; this can be completed during detailed design.</li> <li>Groundwater – dewatering and/or depressurization requirements and anticipated water flow volumes will be confirmed by geotechnical investigations completed in support of detailed design. The determination of which process should be followed (Permit to Take Water (PTTW) or Environmental Activity Sector Registry (EASR)) is based on the expected volume of taking during dewatering; takings between 50,000 L/d and 400,000 L/d are required to register for the EASR while takings above 400,000 L/d are regulated by the PTTW process. If significant dewatering is anticipated, a detailed groundwater management and monitoring plan will be required in support of the dewatering activities.</li> </ul>	<ul style="list-style-type: none"> <li>Authorization under the <i>Endangered Species Act, 2007</i> (ESA) may be required for potential SAR identified above, but especially for tree removal within bat SAR habitat (FOD).</li> <li>DFO Request for Review / Authorization may be required if activities near the HWM could result in impacts to fish or fish habitat.</li> <li>Permit application under O.Reg. 319/09 for interference with wetlands and watercourses. A wetland Environmental Impact Study (EIS) may be required from Quinte Conservation in support of the permit application under O.Reg. 319/09.</li> <li>SPS footprint is within Quinte Conservation Regulation limits and overlaps with the unevaluated wetland associated with the Potter Creek Tributary LSW (treated as PSW), which may require approval from the Quinte Conservation Board.</li> <li>Based on correspondence received from MNRF on October 21, 2019, MNRF highly recommends evaluating the unevaluated wetlands surrounding Potter Creek LSW and confirming the boundaries of the existing LSW as per the Ontario Wetland Evaluation System; this can be completed during detailed design.</li> <li>Groundwater – dewatering and/or depressurization requirements and anticipated water flow volumes will be confirmed by geotechnical investigations completed in support of detailed design. The determination of which process should be followed (Permit to Take Water (PTTW) or Environmental Activity Sector Registry (EASR)) is based on the expected volume of taking during dewatering; takings between 50,000 L/d and 400,000 L/d are required to register for the EASR while takings above 400,000 L/d are regulated by the PTTW process. If significant dewatering is anticipated, a detailed groundwater management and monitoring plan will be required in support of the dewatering activities.</li> </ul>	<ul style="list-style-type: none"> <li>Authorization under the <i>Endangered Species Act, 2007</i> (ESA) may be required for potential SAR identified above.</li> <li>DFO Request for Review / Authorization may be required if activities near the HWM could result in impacts to fish or fish habitat.</li> <li>Permit application under O.Reg. 319/09 for interference with wetlands and watercourses. A wetland Environmental Impact Study (EIS) may be required from Quinte Conservation in support of the permit application under O.Reg. 319/09. A QC Board Hearing may be required under the Conservation Authorities Act, 1990 (pers. comm. February 25, 2020) as a small corner of this alternative is located within the 30 m setback of the Potter Creek Tributary LSW; however, design of the SPS can likely avoid the 30 m setback.</li> <li>Based on correspondence received from MNRF on October 21, 2019, MNRF highly recommends evaluating the unevaluated wetlands surrounding Potter Creek LSW and confirming the boundaries of the existing LSW as per the Ontario Wetland Evaluation System; this can be completed during detailed design.</li> <li>Groundwater – dewatering and/or depressurization requirements and anticipated water flow volumes will be confirmed by geotechnical investigations completed in support of detailed design. The determination of which process should be followed (Permit to Take Water (PTTW) or Environmental Activity Sector Registry (EASR)) is based on the expected volume of taking during dewatering; takings between 50,000 L/d and 400,000 L/d are required to register for the EASR while takings above 400,000 L/d are regulated by the PTTW process. If significant dewatering is anticipated, a detailed groundwater management and monitoring plan will be required in support of the dewatering activities.</li> </ul>	<ul style="list-style-type: none"> <li>Authorization under the <i>Endangered Species Act, 2007</i> (ESA) may be required for potential SAR identified above, but especially for tree removal within bat SAR habitat (SWD) and potentially within the agricultural field if suitable habitat and presence of Bobolink or Eastern Meadowlark is confirmed.</li> <li>DFO Request for Review / Authorization may be required if activities near the HWM could result in impacts to fish or fish habitat.</li> <li>Permit application under O.Reg. 319/09 for interference with wetlands and watercourses. A wetland Environmental Impact Study (EIS) may be required from Quinte Conservation in support of the permit application under O.Reg. 319/09. SPS footprint is within Quinte Conservation Regulation limits and overlaps the Potter Creek Tributary LSW (treated as PSW) within the 30 metre setback, which may require approval from the Quinte Conservation Board. Quinte Conservation confirmed they would not be requesting an EIS as per January 26, 2022 correspondence.</li> <li>Based on correspondence received from MNRF on October 21, 2019, MNRF highly recommends evaluating the unevaluated wetlands surrounding Potter Creek LSW and confirming the boundaries of the existing LSW as per the Ontario Wetland Evaluation System; this can be completed during detailed design.</li> <li>Groundwater – dewatering and/or depressurization requirements and anticipated water flow volumes will be confirmed by geotechnical investigations completed in support of detailed design. The determination of which process should be followed (Permit to Take Water (PTTW) or Environmental Activity Sector Registry (EASR)) is based on the expected volume of taking during dewatering; takings between 50,000 L/d and 400,000 L/d are required to register for the EASR while takings above 400,000 L/d are regulated by the PTTW process. If significant dewatering is anticipated, a detailed groundwater management and monitoring plan will be required in support of the dewatering activities.</li> </ul>
	Natural Environment Potential Constraint Ranking	High (Less Preferred)	Medium (Moderately Preferred)	High (Less Preferred)	Medium (Moderately Preferred)	Low (More Preferred)

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<b>Category &amp; Criteria</b>		<b>SPS Alternative 1</b> Adjacent to Existing Station	<b>SPS Alternative 2</b> North side of Easement from Existing Station	<b>SPS Alternative 3</b> East of Susanna Moodie Elementary School	<b>SPS Alternative 4</b> West side of Marshall Road	<b>SPS Alternative 5</b> East side of Avonlough Road and North of Potter Creek
<b>SOCIO-ECONOMIC ENVIRONMENT</b>	<b>1. Potential effects related to the enjoyment and use of property.</b> <ul style="list-style-type: none"> <li>▪ Visual Impact</li> <li>▪ Odor Control</li> </ul>	<ul style="list-style-type: none"> <li>• Minimal effects anticipated – SPS avoids sensitive land uses. The SPS can be architecturally designed to be aesthetically pleasing and fit in with the surrounding landscape.</li> <li>• SPS lands are planned within future road allowance and open space based on the Preliminary Draft Plan of Subdivision Application.</li> </ul>	<ul style="list-style-type: none"> <li>• Minimal effects anticipated – SPS within sightlines of future residential development to the south; however, the SPS can be architecturally designed to be aesthetically pleasing and fit in with the surrounding landscape.</li> <li>• SPS lands are planned within future road allowance, development block and open space based on the Preliminary Draft Plan of Subdivision Application.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Minimal to moderate effects anticipated – SPS within sightlines of future residential development to the north; however, the SPS can be architecturally designed to be aesthetically pleasing and fit in with the surrounding landscape.</li> <li>• SPS lands are planned within residential lots based on the Preliminary Draft Plan of Subdivision Application.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Minimal to moderate effects anticipated – SPS within sightlines of existing residential dwellings to the east on Marshall Road; however, the SPS can be architecturally designed to be aesthetically pleasing and fit in with the surrounding landscape.</li> <li>▪ SPS lands are planned within residential block based on the Preliminary Draft Plan of Subdivision Application.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Minimal to moderate effects anticipated – SPS is within sightlines of existing elementary school to the north; however, the SPS can be architecturally designed to be aesthetically pleasing and fit in with the surrounding landscape.</li> <li>▪ SPS lands are planned on or next to lands proposed for development (land owner noted that the higher density block is no longer being considered) based on the Preliminary Draft Plan of Subdivision Application.</li> </ul>
	<b>2. Disruption to residences, institutions, businesses, recreational facilities during construction (noise, vibration, dust, access)</b>	<ul style="list-style-type: none"> <li>▪ Minimal (temporary) disruptions anticipated based on the SPS being built prior to the Draft Plan of Subdivision.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Minimal (temporary) disruptions anticipated based on the SPS being built prior to the Draft Plan of Subdivision.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Minimal (temporary) disruptions anticipated based on the SPS being built prior to the Draft Plan of Subdivision.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Temporary disruption (noise) to current single-family residences opposite the SPS.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Temporary disruption (noise) to current Susanna Moodie Elementary School north of the SPS.</li> </ul>
	<b>Socio-economic Environment Potential Constraint Ranking</b>	<b>Low (More Preferred)</b>	<b>Low (More Preferred)</b>	<b>Medium (Moderately Preferred)</b>	<b>High (Less Preferred)</b>	<b>High (Less Preferred)</b>



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<b>Category &amp; Criteria</b>		<b>SPS Alternative 1</b> Adjacent to Existing Station	<b>SPS Alternative 2</b> North side of Easement from Existing Station	<b>SPS Alternative 3</b> East of Susanna Moodie Elementary School	<b>SPS Alternative 4</b> West side of Marshall Road	<b>SPS Alternative 5</b> East side of Avonlough Road and North of Potter Creek
<b>CULTURAL ENVIRONMENT</b>	<b>1. Potential effects on archaeological resources</b>	High potential for the recovery of archaeological resources, given the undisturbed land, distance to potable water, soil texture and drainage and early Euro-Canadian settlement. Stage 2 Archaeological Assessment is required.	High potential for the recovery of archaeological resources, given the undisturbed land, distance to potable water, soil texture and drainage and early Euro-Canadian settlement. Stage 2 Archaeological Assessment is required.	High potential for the recovery of archaeological resources, given the undisturbed land, distance to potable water, soil texture and drainage and early Euro-Canadian settlement. Stage 2 Archaeological Assessment is required.	High potential for the recovery of archaeological resources, given the undisturbed land, distance to potable water, soil texture and drainage and early Euro-Canadian settlement. Stage 2 Archaeological Assessment is required.	High potential for the recovery of archaeological resources, given the undisturbed land, distance to potable water, soil texture and drainage and early Euro-Canadian settlement. Stage 2 Archaeological Assessment is required.
	<b>2. Potential for disruption of built heritage resources</b>	Low potential – SPS avoids known built heritage resources and new SPS can be architecturally designed to be aesthetically pleasing and fit in with the surrounding landscape.	Low potential – SPS avoids known built heritage resources and new SPS can be architecturally designed to be aesthetically pleasing and fit in with the surrounding landscape.	Low potential – SPS avoids known built heritage resources and new SPS can be architecturally designed to be aesthetically pleasing and fit in with the surrounding landscape.	Low potential – SPS avoids known built heritage resources and new SPS can be architecturally designed to be aesthetically pleasing and fit in with the surrounding landscape.	Low potential – SPS avoids known built heritage resources and new SPS can be architecturally designed to be aesthetically pleasing and fit in with the surrounding landscape.
	<b>Cultural Environment Potential Constraint Ranking</b>	<b>Medium (Moderately Preferred)</b>	<b>Medium (Moderately Preferred)</b>	<b>Medium (Moderately Preferred)</b>	<b>Medium (Moderately Preferred)</b>	<b>Medium (Moderately Preferred)</b>

**TABLE 1: Avonlough Sanitary Sewage Pumping Station (SPS) Siting Alternatives**

<b>Category &amp; Criteria</b>		<b>SPS Alternative 1</b> Adjacent to Existing Station	<b>SPS Alternative 2</b> North side of Easement from Existing Station	<b>SPS Alternative 3</b> East of Susanna Moodie Elementary School	<b>SPS Alternative 4</b> West side of Marshall Road	<b>SPS Alternative 5</b> East side of Avonlough Road and North of Potter Creek
<b>COST</b>	<b>1. Cost of construction (including property acquisition).</b> <ul style="list-style-type: none"> <li>▪ <b>Size of site</b></li> <li>▪ <b>Depth of station</b></li> <li>▪ <b>Connection to existing station</b></li> <li>▪ <b>Forcemain vs TSS between Option 1 to 4.</b></li> </ul>	<ul style="list-style-type: none"> <li>▪ Estimated Station Construction Cost \$7.2M</li> <li>▪ Estimated TSS Cost to Convey Flows from the Total Drainage Area (2642m &gt; 8m deep) \$24.6M</li> <li>▪ Estimated Cost to Connect Existing Avonlough SPS to Proposed Alternative SPS 1. \$212,000</li> <li>▪ Estimated Forcemain Cost from Alternative SPS 1 to Bridge/Marshall ~\$1.4M</li> <li>▪ TOTAL \$33.4M</li> </ul>	<ul style="list-style-type: none"> <li>▪ Estimated Station Construction Cost \$7.2M</li> <li>▪ Estimated TSS Cost to Convey Flows from the Total Drainage Area (2618m &gt; 8m deep) \$24.4M</li> <li>▪ Estimated Cost to Connect Existing Avonlough SPS to Proposed Alternative SPS 2. \$265,000</li> <li>▪ Estimated Forcemain Cost from Alternative SPS 2 to Bridge/Marshall ~\$1.3M</li> <li>▪ TOTAL \$33.3M</li> </ul>	<ul style="list-style-type: none"> <li>▪ Estimated Station Construction Cost \$7.3M</li> <li>▪ Estimated TSS Cost to Convey Flows from the Total Drainage Area (2944m &gt; 8m deep) \$24.9M</li> <li>▪ Estimated Cost to Connect Existing Avonlough SPS to Proposed Alternative SPS 3. \$562,000</li> <li>▪ Estimated Forcemain Cost from Alternative SPS 3 to Bridge/Marshall ~\$853,000</li> <li>▪ TOTAL \$33.5M</li> </ul>	<ul style="list-style-type: none"> <li>▪ Estimated Station Construction Cost \$7.6M</li> <li>▪ Estimated TSS Cost to Convey Flows from the Total Drainage Area (2550m &gt; 8m deep) \$22.5M</li> <li>▪ Estimated Cost to Connect Existing Avonlough SPS to Proposed Alternative SPS 4. \$1.7M</li> <li>▪ Estimated Forcemain Cost from Alternative SPS 4 to Bridge/Marshall ~\$362,000</li> <li>▪ TOTAL \$32.0M</li> </ul>	<ul style="list-style-type: none"> <li>▪ Estimated Station Construction Cost \$7.2M</li> <li>▪ Estimated TSS Cost to Convey Flows from the Total Drainage Area (2845m &gt; 8m deep) \$25.1M</li> <li>▪ Estimated Cost to Connect Existing Avonlough SPS to Proposed Alternative SPS 5. \$308,000</li> <li>▪ Estimated Forcemain Cost from Alternative SPS 5 to Bridge/Marshall ~\$1.5M</li> <li>▪ TOTAL \$34.2M</li> </ul>
	<b>2. Cost of operations / maintenance.</b> <ul style="list-style-type: none"> <li>▪ <b>Energy cost</b></li> </ul>	<ul style="list-style-type: none"> <li>▪ Elevation change of +4 m from the surface at the pumping station (87.9 m) to the intersection of Bridge Street and Marshall Road (92 m). Higher initial pressure required to transport sewage via forcemain to the Bridge/ Marshall intersection.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Elevation change of +3 m from the surface at the pumping station (89 m) to the intersection of Bridge Street and Marshall Road (92 m). Higher initial pressure required to transport sewage via forcemain to the Bridge/ Marshall intersection.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Elevation change of +3 m from the surface at the pumping station (89 m) to the intersection of Bridge Street and Marshall Road (92 m). Higher initial pressure required to transport sewage via forcemain to the Bridge/ Marshall intersection.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Deepest sight, larger pumps and more energy required to overcome difference in head.</li> <li>▪ Shorter forcemain length vs Alternative 5.</li> <li>▪ Elevation change of -3 m from the surface of the pumping station (95 m) to the intersection of Bridge Street and Marshall Road (92 m). Lower initial pressure required to transport the sewage via forcemain to the Bridge/ Marshall intersection.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Elevation change of +3 m from the surface at the pumping station (89 m) to the intersection of Bridge Street and Marshall Road (92 m). Higher initial pressure required to transport sewage via forcemain to the Bridge/ Marshall intersection.</li> </ul>
	<b>Cost Potential Constraint Ranking</b>	<b>Medium (Moderately Preferred)</b>	<b>Medium (Moderately Preferred)</b>	<b>Medium (Moderately Preferred)</b>	<b>Medium (Moderately Preferred)</b>	<b>Medium (Moderately Preferred)</b>

**TABLE 1: Avonlough Sanitary Sewage Pumping Station (SPS) Siting Alternatives**

## Table 1: Summary of Evaluation

The table below provides a summary version of the detailed evaluation presented above. SPS Alternative 5 has the lowest overall potential constraints relative to the other alternatives, and is therefore, most preferred.

Category	SPS Alternative 1	SPS Alternative 2	SPS Alternative 3	SPS Alternative 4	SPS Alternative 5
<b>Land Use</b>	High (Less Preferred)	High (Less Preferred)	Medium (Moderately Preferred)	Medium (Moderately Preferred)	Low (More Preferred)
<b>Technical</b>	Medium (Moderately Preferred)	Medium (Moderately Preferred)	High (Less Preferred)	Medium (Moderately Preferred)	Low (More Preferred)
<b>Natural Environment</b>	High (Less Preferred)	Medium (Moderately Preferred)	High (Less Preferred)	Medium (Moderately Preferred)	Low (More Preferred)
<b>Socio-Economic Environment</b>	Low (More Preferred)	Low (More Preferred)	Medium (Moderately Preferred)	High (Less Preferred)	High (Less Preferred)
<b>Cultural Environment</b>	Medium (Moderately Preferred)	Medium (Moderately Preferred)	Medium (Moderately Preferred)	Medium (Moderately Preferred)	Medium (Moderately Preferred)
<b>Cost</b>	Medium (Moderately Preferred)	Medium (Moderately Preferred)	Medium (Moderately Preferred)	Medium (Moderately Preferred)	Medium (Moderately Preferred)
<b>SPS Evaluation - Overall Potential Constraint Ranking</b>	High (Less Preferred SPS Alternative)	Medium (Moderately Preferred SPS Alternative)	High (Less Preferred SPS Alternative)	Medium (Moderately Preferred SPS Alternative)	Low (More Preferred SPS Alternative)

**TABLE 2: Avonlough Forcemain/Gravity/Pressure Sewer Alignment West Side of Moira River**

Category & Criteria		Alignment 1: Potters Creek / Bridge Street West <i>*Applicable to alternative SPS Sites 1, 2, 3 and 5 only</i>	Alignment 2: Proposed Subdivision / Bridge Street West <i>*Applicable to alternative SPS Sites 1, 2, 3 and 5 only</i>	Alignment 3: Existing Forcemain Easement / Bridge Street West <i>*Applicable to alternative SPS Sites 1, 2, 3 and 5 only</i>
Route Details		<ul style="list-style-type: none"> <li>Forcemain located on open/protected space (north side Potters Creek) to Bridge Street to the intersection of Marshall Road and Bridge Street West.</li> <li>Alignment includes combination of Forcemain and Gravity/Pressure sewers from Bridge Street West/Marshall Road to the west side of Moira River at Bridge Street/Highland Avenue.</li> </ul>	<ul style="list-style-type: none"> <li>Forcemain located on future subdivision streets (north side of Potters Creek) to the intersection of Marshall Road and Bridge Street West.</li> <li>Alignment includes combination of Forcemain and Gravity/Pressure sewers from Bridge Street West/Marshall Road to the west side of Moira River at Bridge Street/Highland Avenue.</li> </ul>	<ul style="list-style-type: none"> <li>Forcemain located on existing east to west easement (south of Potters Creek) turning north to the intersection of Marshall Road and Bridge Street West.</li> <li>Alignment includes combination of Forcemain and Gravity/Pressure sewers from Bridge Street West/Marshall Road to the west side of Moira River at Bridge Street/Highland Avenue.</li> </ul>
LAND USE	1. Potential effects on existing or approved/planned land uses	<ul style="list-style-type: none"> <li>Part of Preliminary Draft Plan of Subdivision Application – alignment transects lands planned for open space and SWM pond.</li> </ul> <p><b>Forcemain/Gravity Sewers – Bridge Street West</b></p> <ul style="list-style-type: none"> <li>None anticipated, all infrastructure to be installed within the existing road right-of-way.</li> </ul>	<ul style="list-style-type: none"> <li>Part of Preliminary Draft Plan of Subdivision Application – alignment follows lands planned for future road (Street 'F'). Alignment also transects lands planned for SWM pond and residential development block.</li> </ul> <p><b>Forcemain/Gravity Sewers – Bridge Street West</b></p> <ul style="list-style-type: none"> <li>None anticipated, all infrastructure to be installed within the existing road right-of-way.</li> </ul>	<ul style="list-style-type: none"> <li>Part of Preliminary Draft Plan of Subdivision Application – alignment follows existing road allowance and lands planned for future road (Street 'I')</li> <li>Possible to coordinate with future plans for pathway within existing easement of road allowance.</li> </ul> <p><b>Forcemain/Gravity Sewers – Bridge Street West</b></p> <ul style="list-style-type: none"> <li>None anticipated, all infrastructure to be installed within the existing road right-of-way.</li> </ul>
	2. Potential for conforming with approved local, and provincial plans and policies	<ul style="list-style-type: none"> <li>Development within provincially significant natural areas is prohibited; however, development and site alteration can occur within adjacent lands, as described below, for the following features provided that an Environmental Impact Study (EIS) is completed demonstrating no negative effects on the natural features or its function:                             <ul style="list-style-type: none"> <li>120 m from Provincially Significant Wetland (PSW);</li> <li>50 m from provincially significant woodlands, valley lands, ANSI, wildlife habitat and SAR habitat; and</li> <li>15 m from the High Water Mark (HWM) in the case of fish habitat.</li> </ul> </li> </ul> <p><b>Forcemain/Gravity Sewers – Bridge Street West</b></p> <ul style="list-style-type: none"> <li>Conforms with local and provincial approved plans and policies – infrastructure to be installed within the existing road right-of-way.</li> </ul>	<ul style="list-style-type: none"> <li>Development within provincially significant natural areas is prohibited; however, development and site alteration can occur within adjacent lands, as described below, for the following features provided that an Environmental Impact Study (EIS) is completed demonstrating no negative effects on the natural features or its function:                             <ul style="list-style-type: none"> <li>120 m from PSW;</li> <li>50 m from provincially significant woodlands, valley lands, ANSI, wildlife habitat and SAR habitat; and</li> <li>15 m from the High Water Mark (HWM) in the case of fish habitat.</li> </ul> </li> </ul> <p><b>Forcemain/Gravity Sewers – Bridge Street West</b></p> <ul style="list-style-type: none"> <li>Conforms with local and provincial approved plans and policies – infrastructure to be installed within the existing road right-of-way.</li> </ul>	<ul style="list-style-type: none"> <li>Development within provincially significant natural areas is prohibited; however, development and site alteration can occur within adjacent lands, as described below, for the following features provided that an Environmental Impact Study (EIS) is completed demonstrating no negative effects on the natural features or its function:                             <ul style="list-style-type: none"> <li>120 m from PSW;</li> <li>50 m from provincially significant woodlands, valley lands, ANSI, wildlife habitat and SAR habitat; and</li> <li>15 m from the High Water Mark (HWM) in the case of fish habitat.</li> </ul> </li> </ul> <p><b>Forcemain/Gravity Sewers – Bridge Street West</b></p> <ul style="list-style-type: none"> <li>Conforms with local and provincial approved plans and policies – infrastructure to be installed within the existing road right-of-way.</li> </ul>
Land Use Potential Constraint Ranking		Medium (Moderately Preferred)	Medium (Moderately Preferred)	Low (More Preferred)

**TABLE 2: Avonlough Forcemain/Gravity/Pressure Sewer Alignment West Side of Moira River**

Category & Criteria	Alignment 1: Potters Creek / Bridge Street West <i>*Applicable to alternative SPS Sites 1, 2, 3 and 5 only</i>	Alignment 2: Proposed Subdivision / Bridge Street West <i>*Applicable to alternative SPS Sites 1, 2, 3 and 5 only</i>	Alignment 3: Existing Forcemain Easement / Bridge Street West <i>*Applicable to alternative SPS Sites 1, 2, 3 and 5 only</i>
<b>TECHNICAL</b>  <b>1. Constructability</b> <ul style="list-style-type: none"> <li>▪ Land Use</li> <li>▪ Available property for staging</li> <li>▪ Depth</li> </ul> <b>2. Access and maintenance</b>  <b>3. Future infrastructure coordination opportunities or implementation risks</b>  <b>4. Weighted ranking for implementation with any SPS Alternative</b>  <b>5. Traffic impacts during construction, including expected lane/sidewalk closures and disruption to public transit</b>	<ul style="list-style-type: none"> <li>▪ Forcemain from an SPS to Marshall Rd. and Bridge St. W to utilize the regulatory setback between the environmentally protected or flood plain along Potters Creek.</li> </ul> <p><b>Forcemain/Gravity Sewers – Bridge Street West</b></p> <ul style="list-style-type: none"> <li>▪ Alignment as per the 2010 Master Plan still seen as most favorable east-west corridor for conveyance.</li> <li>▪ Forcemain from SPS to Palmer Rd. Gravity Sewer from Palmer Rd. to Highland Ave. Pressure Sewer from Highland Ave. to the WWTP.</li> <li>▪ Sewer on Bridge St. from Marshall Rd. to Coleman Street will be located within the municipal right of way.</li> <li>▪ Deep installation potentially required to avoid existing infrastructure including storm, sanitary, water, gas and communications.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Forcemain from an SPS to Marshall Rd. to Bridge St. W. to be located within the right of way of future subdivision road network north of Potters Creek.</li> <li>▪ Forcemain should be designed at a depth to provide adequate cover for subdivision cut/fill activity.</li> <li>▪ Staging for construction can take place in conjunction with early stages of development.</li> </ul> <p><b>Forcemain/Gravity Sewers – Bridge Street West</b></p> <ul style="list-style-type: none"> <li>▪ Alignment as per the 2010 Master Plan still seen as most favorable east-west corridor for conveyance.</li> <li>▪ Forcemain from SPS to Palmer Rd. Gravity Sewer from Palmer Rd. to Highland Ave. Pressure Sewer from Highland Ave. to the WWTP.</li> <li>▪ Sewer on Bridge St. from Marshall Rd. to Coleman Street will be located within the municipal right of way.</li> <li>▪ Deep installation potentially required to avoid existing infrastructure including storm, sanitary, water, gas and communications.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Forcemain from an SPS to Marshall Rd. to Bridge St. W. to be located within the existing utility easement running east from Avonlough Rd.</li> <li>▪ Land acquisition will be required from the owner of the property north of Potter Creek for an easement running north from the east-west corridor.</li> <li>▪ Current location of the forcemain from the Avonlough SPS.</li> <li>▪ This easement is within the open space south of the creek.</li> <li>▪ 20 m setback required from the regulatory flood plain line for all development.</li> <li>▪ Minimum cover can be used as no future development can take place on this land.</li> </ul> <p><b>Forcemain/Gravity Sewers – Bridge Street West</b></p> <ul style="list-style-type: none"> <li>▪ Alignment as per the 2010 Master Plan still seen as most favorable east-west corridor for conveyance.</li> <li>▪ Forcemain from SPS to Palmer Rd. Gravity Sewer from Palmer Rd. to Highland Ave. Pressure Sewer from Highland Ave. to the WWTP.</li> <li>▪ Sewer on Bridge St. from Marshall Rd. to Coleman Street will be located within the municipal right of way.</li> <li>▪ Deep installation potentially required to avoid existing infrastructure including storm, sanitary, water, gas and communications.</li> </ul>
	<ul style="list-style-type: none"> <li>▪ Limited access to forcemain alignment within regulatory setback as no permanent access will be provided to this land – new access required.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Access to the forcemain for maintenance is provided by the subdivision road network.</li> <li>▪ Valve chambers would be located within the driving surface of the subdivision.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Limited access to forcemain alignment within regulatory setback as no permanent access will be provided to this land.</li> <li>▪ Can provide access via proposed multi-use pathway to be constructed within the easement.</li> </ul>
	<ul style="list-style-type: none"> <li>▪ Forcemain within the regulatory setback can be installed prior to the future development with no coordination with the developer required.</li> <li>▪ Permits and construction timing window will depend on a review of the work by the conservation authority. Open cut work must take place during dry months.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Opportunity to coordinate the forcemain alignment with the future subdivision.</li> <li>▪ Risk on choosing this option prior to the completion of the subdivision design.</li> <li>▪ Major coordination required between the developer and the City. The developer is open to setting the proposed road network in order to assist if alignment is selected.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Forcemain within the regulatory setback can be installed prior to the future development with no coordination with the developer.</li> <li>▪ Permits and construction timing window will depend on a review of the work by the conservation authority. Open cut work must take place during dry months.</li> <li>▪ Risk of damaging proposed bike trail being implemented in the near future.</li> </ul>
	<ul style="list-style-type: none"> <li>▪ Very compatible with SPS alternative sites 1, 2, 3 and 5 with an alignment either side of the creek.</li> <li>▪ SPS alternative site 4 is not applicable to this alignment.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Very compatible with SPS alternative sites 1, 2, 3 and 5 with an alignment either side of the creek.</li> <li>▪ SPS alternative site 4 is not applicable to this alignment.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Very compatible with SPS alternative sites 1, 2, 3 and 5 with an alignment either side of the creek.</li> <li>▪ SPS alternative site 4 is not applicable to this alignment.</li> </ul>
	<ul style="list-style-type: none"> <li>▪ No anticipated traffic impacts during construction of the forcemain from the SPS to Marshall Rd. and Bridge St. W.</li> </ul> <p><b>Forcemain/Gravity Sewers – Bridge Street West</b></p> <ul style="list-style-type: none"> <li>▪ Major traffic disruption anticipated on Bridge St. for deep open cut installation of the sewer.</li> </ul>	<ul style="list-style-type: none"> <li>▪ No anticipated traffic impacts foreseen during construction of the forcemain from the SPS to Marshall Rd. and Bridge St. W. assuming the infrastructure is installed prior to the completion of the subdivision.</li> </ul> <p><b>Forcemain/Gravity Sewers – Bridge Street West</b></p> <ul style="list-style-type: none"> <li>▪ Major traffic disruption anticipated on Bridge St. for deep open cut installation of the sewer.</li> </ul>	<ul style="list-style-type: none"> <li>▪ No anticipated traffic impacts during construction of the forcemain from the SPS to Marshall Rd. and Bridge St. W.</li> </ul> <p><b>Forcemain/Gravity Sewers – Bridge Street West</b></p> <ul style="list-style-type: none"> <li>▪ Major traffic disruption anticipated on Bridge St. for deep open cut installation of the sewer.</li> </ul>
<b>Technical Potential Constraint Ranking</b>	<p style="text-align: center;"><b>Low (More Preferred)</b></p>	<p style="text-align: center;"><b>Medium (Moderately Preferred)</b></p>	<p style="text-align: center;"><b>Low (More Preferred)</b></p>

**TABLE 2: Avonlough Forcemain/Gravity/Pressure Sewer Alignment West Side of Moira River**

<b>NATURAL ENVIRONMENT</b>	<p><b>1. Potential effects on terrestrial/aquatic habitat and species</b></p>	<p><b>Terrestrial Environment</b></p> <ul style="list-style-type: none"> <li>▪ There are no Areas of Natural or Scientific Interest (ANSIs) within 120 m of Alignment 1.</li> <li>▪ The City of Belleville’s Environmental Protection Area associated with Potter Creek, Significant Woodland, and the Potter Creek Tributary Locally Significant Wetland (LSW; though treated as a provincially significant wetland [PSW]) is located within 120 m of Alignment 1. The Significant Woodland is not anticipated to be affected as it is on the west side of Avonlough, however, this alignment transects the Environmental Protection Area and Potter Creek Tributary LSW and may be affected by vegetation removal, dewatering activities, sedimentation and erosion and soil and water contamination.</li> <li>▪ This alignment will require the least vegetation removal, potentially including sensitive wetland vegetation within the LSW.</li> <li>▪ There are 11 candidate Significant Wildlife Habitats (SWH) that may be present within 120 m of this alignment, including habitat for 12 Species of Conservation Concern (SOCC). SOCC are not protected under the provincial Endangered Species Act (ESA), but receive protection from the 2014 Provincial Policy Statement (PPS) and other planning documents).</li> <li>▪ Wildlife, including bats, Migratory Bird Convention Act, 1994 (MBCA) protected breeding birds and SOCC will be affected by vegetation removal via habitat loss and potential displacement or disturbance. Sensitive wildlife restrictive timing for vegetation/tree removal will apply, such as outside of the breeding bird season (April 1 to August 31) and bat active season (March 30 to October 1).</li> </ul> <p><b>Aquatic Environment</b></p> <ul style="list-style-type: none"> <li>▪ This alignment falls within the Quinte Conservation (QC) regulation limits.</li> <li>▪ Alignment 1 overlaps direct fish habitat in the Potter Creek Tributary. Work in and near water could potentially impact fish and fish habitat via the following: <ul style="list-style-type: none"> <li>○ Potential changes in sediment and / or contaminant concentrations in the event of the release of sediment and / or deleterious substances to the watercourse.</li> <li>○ Potential changes to habitat structure, instream and / or canopy cover as a result of the removal and / or alteration of riparian and / or aquatic vegetation.</li> <li>○ Potential for changes in baseflow or water temperatures as a result of alterations of groundwater flows to surface water and / or changes in slope or drainage or the placement of material or fill in water.</li> <li>○ Potential changes in food and / or nutrient concentrations as a result of the removal and / or alteration of riparian vegetation.</li> <li>○ Potential change in channel or shoreline morphology as a result of encroachment of permanent infrastructure into the aquatic environment.</li> <li>○ Potential changes in substrate composition that could alter key habitat features such as food, nutrient supply and existing structure and cover.</li> <li>○ Potential fish mortality as a result of work below the high water mark.</li> </ul> </li> </ul> <p><b>Forcemain/Gravity Sewers – Bridge Street West</b></p> <p><b>Terrestrial Environment:</b></p> <ul style="list-style-type: none"> <li>▪ There are no ANSIs or significant woodlands within 120 m of the Forcemain / Gravity Sewers Along Bridge Street West.</li> <li>▪ Potter Creek Tributary LSW (treated as PSW) and Environmental Protection Area are located within 120 m of the forcemain near Marshall Road, but there are no other LSWs or PSWs within 120 m of the forcemain and gravity sewer.</li> <li>▪ Assumes little to no vegetation will be required for the forcemain and gravity sewer. Where vegetation removal may be required, this will likely be limited to street trees or landscape vegetation.</li> </ul>	<p><b>Terrestrial Environment</b></p> <ul style="list-style-type: none"> <li>▪ There are no ANSIs within 120 m of Alignment 2.</li> <li>▪ The City of Belleville’s Environmental Protection Area associated with Potter Creek, Significant Woodland, and the Potter Creek Tributary Locally Significant Wetland (LSW; though treated as a PSW) is located within 120 m of Alignment 2. The Significant Woodland is not anticipated to be affected as it is on the west side of Avonlough, however, this alignment transects the Environmental Protection Area and Potter Creek Tributary LSW and may be affected by vegetation removal, dewatering activities, sedimentation and erosion and soil and water contamination..</li> <li>▪ This alignment will require the most vegetation removal, potentially including sensitive wetland vegetation within the LSW.</li> <li>▪ There are 11 candidate SWH that may be present within 120 m of this alignment, including habitat for 12 SOCC. SOCC are not protected under the provincial ESA, but receive protection from the PPS and other planning documents).</li> <li>▪ Wildlife, including bats, MBCA protected breeding birds and SOCC will be affected by vegetation removal via habitat loss and potential displacement or disturbance. Sensitive wildlife restrictive timing for vegetation/tree removal will apply, such as outside of the breeding bird season (April 1 to August 31) and bat active season (March 30 to October 1).</li> </ul> <p><b>Aquatic Environment</b></p> <ul style="list-style-type: none"> <li>▪ This alignment falls within the QC regulation limits.</li> <li>▪ Alignment 2 overlaps direct fish habitat in the Potter Creek Tributary. Work in and near water could potentially impact fish and fish habitat via the following: <ul style="list-style-type: none"> <li>○ Potential changes in sediment and / or contaminant concentrations in the event of the release of sediment and / or deleterious substances to the watercourse.</li> <li>○ Potential changes to habitat structure, instream and / or canopy cover as a result of the removal and / or alteration of riparian and aquatic vegetation.</li> <li>○ Potential for changes in baseflow or water temperatures as a result of alterations of groundwater flows to surface water and / or changes in slope or drainage.</li> <li>○ Potential changes in food and / or nutrient concentrations as a result of the removal and / or alteration of riparian and aquatic vegetation.</li> <li>○ Potential change in channel or shoreline morphology as a result of the encroachment of permanent infrastructure into the aquatic environment.</li> <li>○ Potential changes in substrate composition that could alter key habitat features such as food, nutrient supply and existing structure and cover.</li> <li>○ Potential mortality of fish as a result of work below the HWM</li> </ul> </li> </ul> <p><b>Forcemain/Gravity Sewers – Bridge Street West</b></p> <p><b>Terrestrial Environment:</b></p> <ul style="list-style-type: none"> <li>▪ There are no ANSIs or significant woodlands within 120 m of the Forcemain / Gravity Sewers Along Bridge Street West.</li> <li>▪ Potter Creek Tributary LSW (treated as PSW) and Environmental Protection Area are located within 120 m of the forcemain near Marshall Road, but there are no other LSWs or PSWs within 120 m of the forcemain and gravity sewer.</li> <li>▪ Assumes little to no vegetation will be required for the forcemain and gravity sewer. Where vegetation removal may be required, this will likely be limited to street trees or landscape vegetation.</li> </ul>	<p><b>Terrestrial Environment</b></p> <ul style="list-style-type: none"> <li>▪ There are no ANSIs within 120 m of Alignment 3.</li> <li>▪ The City of Belleville’s Environmental Protection Area associated with Potter Creek, Significant Woodland, and the Potter Creek Tributary Locally Significant Wetland (LSW; though treated as a PSW) is located within 120 m of Alignment 3. The Significant Woodland is not anticipated to be affected as it is on the west side of Avonlough, and this alignment does not transect the Environmental Protection Area and Potter Creek Tributary LSW but runs parallel and adjacent to these features and may be affected by vegetation removal, dewatering activities, sedimentation and erosion and soil and water contamination..</li> <li>▪ This alignment will require the second least of vegetation removal as it will be limited to within the existing forcemain easement (east to west segment) and proposed future road (north to south segment) as part of an approved subdivision, but may still require removal of sensitive wetland vegetation with the LSW.</li> <li>▪ There are 11 candidate SWH that may be present within 120 m of this alignment, including habitat for 12 SOCC. SOCC are not protected under the provincial ESA, but receive protection from the PPS and other planning documents).</li> <li>▪ Wildlife, including bats, MBCA protected breeding birds and SOCC will be affected by vegetation removal via habitat loss and potential displacement or disturbance. Sensitive wildlife restrictive timing for vegetation/tree removal will apply, such as outside of the breeding bird season (April 1 to August 31) and bat active season (March 30 to October 1).</li> </ul> <p><b>Aquatic Environment</b></p> <ul style="list-style-type: none"> <li>▪ This alignment falls within the QC regulation limits.</li> <li>▪ Alignment 3 overlaps direct fish habitat in Potter Creek Tributary. Work in and near water could potentially impact fish and fish habitat via the following: <ul style="list-style-type: none"> <li>○ Potential changes in sediment and / or contaminant concentrations in the event of the release of sediment and / or deleterious substances to the watercourse.</li> <li>○ Potential changes to habitat structure, instream and / or canopy cover as a result of the removal and / or alteration of riparian and aquatic vegetation.</li> <li>○ Potential for changes in baseflow or water temperatures as a result of alterations of groundwater flows to surface water and / or changes in slope or drainage.</li> <li>○ Potential changes in food and / or nutrient concentrations as a result of the removal and / or alteration of riparian and aquatic vegetation.</li> <li>○ Potential change in channel or shoreline morphology as a result of the encroachment of permanent infrastructure into the aquatic environment.</li> <li>○ Potential changes in substrate composition that could alter key habitat features such as food, nutrient supply and existing structure and cover.</li> <li>○ Potential mortality of fish as a result of work below the HWM.</li> </ul> </li> </ul> <p><b>Forcemain/Gravity Sewers – Bridge Street West</b></p> <p><b>Terrestrial Environment:</b></p> <ul style="list-style-type: none"> <li>▪ There are no ANSIs or significant woodlands within 120 m of the Forcemain / Gravity Sewers Along Bridge Street West.</li> <li>▪ Potter Creek Tributary LSW (treated as PSW) and Environmental Protection Area are located within 120 m of the forcemain near Marshall Road, but there are no other LSWs or PSWs within 120 m of the forcemain and gravity sewer.</li> <li>▪ Assumes little to no vegetation will be required for the forcemain and gravity sewer. Where vegetation removal may be required, this will likely be limited to street trees or landscape vegetation.</li> </ul>
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**TABLE 2: Avonlough Forcemain/Gravity/Pressure Sewer Alignment West Side of Moira River**

Category & Criteria	Alignment 1: Potters Creek / Bridge Street West <i>*Applicable to alternative SPS Sites 1, 2, 3 and 5 only</i>	Alignment 2: Proposed Subdivision / Bridge Street West <i>*Applicable to alternative SPS Sites 1, 2, 3 and 5 only</i>	Alignment 3: Existing Forcemain Easement / Bridge Street West <i>*Applicable to alternative SPS Sites 1, 2, 3 and 5 only</i>
<p><b>2. Potential effects on Species at Risk (SAR) and their habitat</b></p>	<ul style="list-style-type: none"> <li>Two candidate SWH were identified for the forcemain component where adjacent forests are present, including habitat for 3 SOCC; no candidate SWH were identified for the gravity sewer as its limited within the right-of-way of Bridge Street West which is surrounded by manicured lawns in a residential area.</li> <li>Wildlife, including bats, Migratory Bird Convention Act, 1994 (MBCA) protected breeding birds and SOCC will be affected by vegetation removal via habitat loss and potential displacement or disturbance. Sensitive wildlife restrictive timing for vegetation/tree removal will apply, such as outside of the breeding bird season (April 1 to August 31) and bat active season (March 30 to October 1).</li> </ul> <p><b>Aquatic Environment</b></p> <ul style="list-style-type: none"> <li>The western most portion of the forcemain component near Marshall Road is located within the QC regulation limits but not for the remainder of the forcemain and gravity sewer.</li> <li>The forcemain component overlaps potential direct fish habitat in Potter Creek Tributary.</li> <li>If in-water work is proposed, the in-water work timing window (i.e., when in water works can occur) of July 1 to March 31 applies for all water features within the Project Study Area except for the Bay of Quinte.</li> </ul>	<ul style="list-style-type: none"> <li>Two candidate SWH were identified for the forcemain component where adjacent forests are present, including habitat for 3 SOCC; no candidate SWH were identified for the gravity sewer as its limited within the right-of-way of Bridge Street West which is surrounded by manicured lawns in a residential area.</li> <li>Wildlife, including bats, Migratory Bird Convention Act, 1994 (MBCA) protected breeding birds and SOCC will be affected by vegetation removal via habitat loss and potential displacement or disturbance. Sensitive wildlife restrictive timing for vegetation/tree removal will apply, such as outside of the breeding bird season (April 1 to August 31) and bat active season (March 30 to October 1).</li> </ul> <p><b>Aquatic Environment</b></p> <ul style="list-style-type: none"> <li>The western most portion of the forcemain component near Marshall Road is located within the QC regulation limits but not for the remainder of the forcemain and gravity sewer.</li> <li>The forcemain component overlaps potential direct fish habitat in Potter Creek Tributary.</li> <li>If in-water work is proposed, the in-water work timing window (i.e., when in water works can occur) of July 1 to March 31 applies for all water features within the Project Study Area except for the Bay of Quinte.</li> </ul>	<ul style="list-style-type: none"> <li>Two candidate SWH were identified for the forcemain component where adjacent forests are present, including habitat for 3 SOCC; no candidate SWH were identified for the gravity sewer as its limited within the right-of-way of Bridge Street West which is surrounded by manicured lawns in a residential area.</li> <li>Wildlife, including bats, Migratory Bird Convention Act, 1994 (MBCA) protected breeding birds and SOCC will be affected by vegetation removal via habitat loss and potential displacement or disturbance. Sensitive wildlife restrictive timing for vegetation/tree removal will apply, such as outside of the breeding bird season (April 1 to August 31) and bat active season (March 30 to October 1).</li> </ul> <p><b>Aquatic Environment</b></p> <ul style="list-style-type: none"> <li>The western most portion of the forcemain component near Marshall Road is located within the QC regulation limits but not for the remainder of the forcemain and gravity sewer.</li> <li>The forcemain component overlaps potential direct fish habitat in Potter Creek Tributary.</li> <li>If in-water work is proposed, the in-water work timing window (i.e., when in water works can occur) of July 1 to March 31 applies for all water features within the Project Study Area except for the Bay of Quinte.</li> </ul>
	<p><b>Terrestrial Environment</b></p> <ul style="list-style-type: none"> <li>The following SAR and their habitat may potentially occur in or within 120 m of the Alignment 1 based on identified ELC from aerial photo interpretation: <ul style="list-style-type: none"> <li>Endangered: 6 (Pale-bellied Frost Lichen, Little Brown Myotis, Eastern Small-footed Myotis, Northern Myotis, Tri-colored Bat, and Butternut).</li> <li>Threatened: 6 (Barn Swallow*, Bobolink, Chimney Swift*, Eastern Meadowlark, Least Bittern, and Blanding's Turtle).</li> </ul> </li> </ul> <p><b>Aquatic Environment</b></p> <ul style="list-style-type: none"> <li>There are no aquatic SAR within Potter Creek Tributary.</li> </ul> <p>*Species has potential of occurring within 120 m but outside of the immediate alignment based on presence of suitable habitat identified through aerial photo interpretation.</p> <p><b>Forcemain/Gravity Sewers – Bridge Street West</b></p> <p><b>Terrestrial Environment</b></p> <ul style="list-style-type: none"> <li>The following SAR and their habitat may potentially occur in or within 120 m of the Alignment based on identified ELC from aerial photo interpretation: <ul style="list-style-type: none"> <li>Endangered: 7 (Loggerhead Shrike*, Pale-bellied Frost Lichen*, Little Brown Myotis*, Eastern Small-footed Myotis*, Northern Myotis*, Tri-colored Bat*, and Butternut*).</li> <li>Threatened: 6 (Barn Swallow*, Bobolink*, Chimney Swift*, Eastern Meadowlark*, Least Bittern*, and Blanding's Turtle*).</li> </ul> </li> </ul> <p><b>Aquatic Environment</b></p> <p>There are no aquatic SAR within Potter Creek Tributary. None of these SAR have the potential to occur within the immediate forcemain or gravity sewer as these are limited to within the right-of-way of Bridge Street West.</p> <p>*Species has potential of occurring within 120 m but outside of the immediate alignment based on presence of suitable habitat identified through aerial photo interpretation.</p>	<p><b>Terrestrial Environment</b></p> <ul style="list-style-type: none"> <li>The following SAR and their habitat may potentially occur in or within 120 m of the Alignment 2 based on identified ELC from aerial photo interpretation: <ul style="list-style-type: none"> <li>Endangered: 6 (Pale-bellied Frost Lichen, Little Brown Myotis, Eastern Small-footed Myotis, Northern Myotis, Tri-colored Bat, and Butternut).</li> <li>Threatened: 6 (Barn Swallow*, Bobolink, Chimney Swift*, Eastern Meadowlark, Least Bittern, and Blanding's Turtle).</li> </ul> </li> </ul> <p><b>Aquatic Environment</b></p> <p>There are no aquatic SAR within Potter Creek Tributary. *Species has potential of occurring within 120 m but outside of the immediate alignment based on presence of suitable habitat identified through aerial photo interpretation.</p> <p><b>Forcemain/Gravity Sewers – Bridge Street West</b></p> <p><b>Terrestrial Environment</b></p> <ul style="list-style-type: none"> <li>The following SAR and their habitat may potentially occur in or within 120 m of the Alignment based on identified ELC from aerial photo interpretation: <ul style="list-style-type: none"> <li>Endangered: 7 (Loggerhead Shrike*, Pale-bellied Frost Lichen*, Little Brown Myotis*, Eastern Small-footed Myotis*, Northern Myotis*, Tri-colored Bat*, and Butternut*).</li> <li>Threatened: 6 (Barn Swallow*, Bobolink*, Chimney Swift*, Eastern Meadowlark*, Least Bittern*, and Blanding's Turtle*).</li> </ul> </li> </ul> <p><b>Aquatic Environment</b></p> <p>There are no aquatic SAR within Potter Creek Tributary. None of these SAR have the potential to occur within the immediate forcemain or gravity sewer as these are limited to within the right-of-way of Bridge Street West.</p> <p>*Species has potential of occurring within 120 m but outside of the immediate alignment based on presence of suitable habitat identified through aerial photo interpretation.</p>	<p><b>Terrestrial Environment</b></p> <ul style="list-style-type: none"> <li>The following SAR and their habitat may potentially occur in or within 120 m of the Alignment 3 based on identified ELC from aerial photo interpretation: <ul style="list-style-type: none"> <li>Endangered: 7 (Loggerhead Shrike, Pale-bellied Frost Lichen, Little Brown Myotis, Eastern Small-footed Myotis, Northern Myotis, Tri-colored Bat, and Butternut).</li> <li>Threatened: 6 (Barn Swallow*, Bobolink*, Chimney Swift*, Eastern Meadowlark*, Least Bittern*, and Blanding's Turtle*).</li> </ul> </li> </ul> <p><b>Aquatic Environment</b></p> <p>There are no aquatic SAR within Potter Creek Tributary. *Species has potential of occurring within 120 m but outside of the immediate alignment based on presence of suitable habitat identified through aerial photo interpretation.</p> <p><b>Forcemain/Gravity Sewers – Bridge Street West</b></p> <p><b>Terrestrial Environment</b></p> <ul style="list-style-type: none"> <li>The following SAR and their habitat may potentially occur in or within 120 m of the Alignment based on identified ELC from aerial photo interpretation: <ul style="list-style-type: none"> <li>Endangered: 7 (Loggerhead Shrike*, Pale-bellied Frost Lichen*, Little Brown Myotis*, Eastern Small-footed Myotis*, Northern Myotis*, Tri-colored Bat*, and Butternut*).</li> <li>Threatened: 6 (Barn Swallow*, Bobolink*, Chimney Swift*, Eastern Meadowlark*, Least Bittern*, and Blanding's Turtle*).</li> </ul> </li> </ul> <p><b>Aquatic Environment</b></p> <p>There are no aquatic SAR within Potter Creek Tributary. None of these SAR have the potential to occur within the immediate forcemain or gravity sewer as these are limited to within the right-of-way of Bridge Street West.</p> <p>*Species has potential of occurring within 120 m but outside of the immediate alignment based on presence of suitable habitat identified through aerial photo interpretation.</p>

NATURAL ENVIRONMENT

**TABLE 2: Avonlough Forcemain/Gravity/Pressure Sewer Alignment West Side of Moira River**

<b>Category &amp; Criteria</b>		<b>Alignment 1: Potters Creek / Bridge Street West</b> <i>*Applicable to alternative SPS Sites 1, 2, 3 and 5 only</i>	<b>Alignment 2: Proposed Subdivision / Bridge Street West</b> <i>*Applicable to alternative SPS Sites 1, 2, 3 and 5 only</i>	<b>Alignment 3: Existing Forcemain Easement / Bridge Street West</b> <i>*Applicable to alternative SPS Sites 1, 2, 3 and 5 only</i>
<b>NATURAL ENVIRONMENT</b>	<b>3. Potential effects on surface water including source protection and groundwater</b>	<ul style="list-style-type: none"> <li>▪ Transects Potter Creek Floodline.</li> <li>▪ Close proximity to Potter Creek.</li> <li>▪ Anticipated Dewatering.</li> <li>▪ Located within limits of Highly Vulnerable Aquifer and Intake Protection Zone 3.</li> </ul> <p><b>Forcemain/Gravity Sewers – Bridge Street West</b></p> <ul style="list-style-type: none"> <li>▪ Located within limits of Highly Vulnerable Aquifer and storm sewer shed of Intake Protection Zone 2. The planned linear pipework will not be connected to the storm sewer system and the design objective for addressing conflicts along this corridor is to be located below the existing storm sewer system and utilities.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Transects Potter Creek Floodline</li> <li>▪ Anticipated Dewatering.</li> <li>▪ Located within limits of Highly Vulnerable Aquifer and Intake Protection Zone 3.</li> </ul> <p><b>Forcemain/Gravity Sewers – Bridge Street West</b></p> <ul style="list-style-type: none"> <li>▪ Located within limits of Highly Vulnerable Aquifer and storm sewer shed of Intake Protection Zone 2. The planned linear pipework will not be connected to the storm sewer system and the design objective for addressing conflicts along this corridor is to be located below the existing storm sewer system and utilities.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Transects Potter Creek Floodline.</li> <li>▪ Anticipated Dewatering.</li> <li>▪ Located within limits of Highly Vulnerable Aquifer and Intake Protection Zone 3.</li> </ul> <p><b>Forcemain/Gravity Sewers – Bridge Street West</b></p> <ul style="list-style-type: none"> <li>▪ Located within limits of Highly Vulnerable Aquifer and storm sewer shed of Intake Protection Zone 2. The planned linear pipework will not be connected to the storm sewer system and the design objective for addressing conflicts along this corridor is to be located below the existing storm sewer system and utilities.</li> </ul>
	<b>4. Potential to encounter soil and water contamination</b>	<ul style="list-style-type: none"> <li>• Low potential to encounter soil and water contamination.</li> </ul> <p><b>Forcemain/Gravity Sewers – Bridge Street West</b></p> <ul style="list-style-type: none"> <li>▪ Moderate potential to encounter soil and water contamination.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Low potential to encounter soil and water contamination.</li> </ul> <p><b>Forcemain/Gravity Sewers – Bridge Street West</b></p> <ul style="list-style-type: none"> <li>▪ Moderate potential to encounter soil and water contamination.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Low potential to encounter soil and water contamination.</li> </ul> <p><b>Forcemain/Gravity Sewers – Bridge Street West</b></p> <ul style="list-style-type: none"> <li>▪ Moderate potential to encounter soil and water contamination.</li> </ul>
	<b>5. Anticipated environmental permitting and approval considerations</b>	<ul style="list-style-type: none"> <li>▪ Permit/Authorization or Registration under the ESA may be required for potential SAR identified above.</li> <li>▪ DFO Request for Review / Authorization may be required if activities near or below the HWM could result in potential impacts to fish or fish habitat.</li> <li>▪ Permit under SARA may be required work in or near the HWM could impact potential Channel Darter within Potter Creek Tributary.</li> <li>▪ Permit application under O.Reg. 319/09.</li> <li>▪ Alignment 1 is within Quinte Conservation Regulation limits and overlaps the Potter Creek Tributary LSW (treated as PSW) setback, which may require approval from the Quinte Conservation Board.</li> <li>▪ An EIS may be required by Quinte Conservation (QC) and the City of Belleville.</li> <li>▪ Groundwater – dewatering and/or depressurization requirements and anticipated water flow volumes will be confirmed by geotechnical investigations completed in support of detailed design. The determination of which process should be followed (Permit to Take Water (PTTW) or Environmental Activity Sector Registry (EASR)) is based on the expected volume of taking during dewatering; takings between 50,000 L/d and 400,000 L/d are required to register for the EASR while takings above 400,000 L/d are regulated by the PTTW process. If significant dewatering is anticipated, a detailed groundwater management and monitoring plan will be required in support of the dewatering activities.</li> </ul> <p><b>Forcemain/Gravity Sewers – Bridge Street West</b></p> <ul style="list-style-type: none"> <li>▪ Permit/Authorization or Registration under the ESA may be required for potential SAR identified above.</li> <li>▪ DFO Request for Review / Authorization may be required for the forcemain component if activities near or below the HWM could result in potential impacts to fish or fish habitat.</li> <li>▪ Permit under SARA may be required if activities in or near the HWM could result in impacts to potential Channel Darter within Potter Creek Tributary.</li> <li>▪ Permit application under O.Reg. 319/09.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Permit/Authorization or Registration under the ESA may be required for potential SAR identified above.</li> <li>▪ DFO Request for Review / Authorization may be required if activities near or below the HWM could result in potential impacts to fish or fish habitat.</li> <li>▪ Permit under SARA may be required if work in or near the HWM could result in impacts to potential Channel Darter within Potter Creek Tributary.</li> <li>▪ Permit application under O.Reg. 319/09.</li> <li>▪ Alignment 2 is within Quinte Conservation Regulation limits and overlaps the Potter Creek Tributary LSW (treated as PSW) , which may require approval from the Quinte Conservation Board.</li> <li>▪ An EIS may be required by QC and the City of Belleville.</li> <li>▪ Groundwater – dewatering and/or depressurization requirements and anticipated water flow volumes will be confirmed by geotechnical investigations completed in support of detailed design. The determination of which process should be followed (Permit to Take Water (PTTW) or Environmental Activity Sector Registry (EASR)) is based on the expected volume of taking during dewatering; takings between 50,000 L/d and 400,000 L/d are required to register for the EASR while takings above 400,000 L/d are regulated by the PTTW process. If significant dewatering is anticipated, a detailed groundwater management and monitoring plan will be required in support of the dewatering activities.</li> </ul> <p><b>Forcemain/Gravity Sewers – Bridge Street West</b></p> <ul style="list-style-type: none"> <li>▪ Permit/Authorization or Registration under the ESA may be required for potential SAR identified above.</li> <li>▪ DFO Request for Review / Authorization may be required for the forcemain component if activities near or below the HWM could result in potential impacts to fish or fish habitat.</li> <li>▪ Permit under SARA may be required if activities in or near the HWM could result in impacts to potential Channel Darter within Potter Creek Tributary.</li> <li>▪ Permit application under O.Reg. 319/09.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Permit/Authorization or Registration under the ESA may be required for potential SAR identified above.</li> <li>▪ DFO Request for Review / Authorization may be required if activities near or below the HWM could result in potential impacts to fish or fish habitat.</li> <li>▪ Permit under SARA may be required if work in or near the HWM could result in impacts to potential Channel Darter within Potter Creek Tributary.</li> <li>▪ Permit application under O.Reg. 319/09.</li> <li>▪ Alignment 3 is within Quinte Conservation Regulation limits and overlaps the Potter Creek Tributary LSW (treated as PSW), which may require approval from the Quinte Conservation Board.</li> <li>▪ An EIS may be required by QC and the City of Belleville.</li> <li>▪ Groundwater – dewatering and/or depressurization requirements and anticipated water flow volumes will be confirmed by geotechnical investigations completed in support of detailed design. The determination of which process should be followed (Permit to Take Water (PTTW) or Environmental Activity Sector Registry (EASR)) is based on the expected volume of taking during dewatering; takings between 50,000 L/d and 400,000 L/d are required to register for the EASR while takings above 400,000 L/d are regulated by the PTTW process. If significant dewatering is anticipated, a detailed groundwater management and monitoring plan will be required in support of the dewatering activities.</li> </ul> <p><b>Forcemain/Gravity Sewers – Bridge Street West</b></p> <ul style="list-style-type: none"> <li>▪ Permit/Authorization or Registration under the ESA may be required for potential SAR identified above.</li> <li>▪ DFO Request for Review / Authorization may be required for the forcemain component if activities near or below the HWM could result in potential impacts to fish or fish habitat.</li> <li>▪ Permit under SARA may be required if activities in or near the HWM could result in impacts to potential Channel Darter within Potter Creek Tributary.</li> <li>▪ Permit application under O.Reg. 319/09.</li> </ul>
	<b>Natural Environment Potential Constraint Ranking</b>	<b>High (Less Preferred)</b>	<b>High (Less Preferred)</b>	<b>Low (More Preferred)</b>



**TABLE 2: Avonlough Forcemain/Gravity/Pressure Sewer Alignment West Side of Moira River**

<b>Category &amp; Criteria</b>		<b>Alignment 1: Potters Creek / Bridge Street West</b> <i>*Applicable to alternative SPS Sites 1, 2, 3 and 5 only</i>	<b>Alignment 2: Proposed Subdivision / Bridge Street West</b> <i>*Applicable to alternative SPS Sites 1, 2, 3 and 5 only</i>	<b>Alignment 3: Existing Forcemain Easement / Bridge Street West</b> <i>*Applicable to alternative SPS Sites 1, 2, 3 and 5 only</i>
<b>SOCIO-ECONOMIC ENVIRONMENT</b>	<p>1. <b>Potential effects related to the enjoyment and use of property including disruption to residences, institutions, businesses, recreational facilities during construction (noise, vibration, dust, access)</b></p>	<ul style="list-style-type: none"> <li>▪ Temporary disruption (noise) to current Susanna Moodie Elementary School north of the forcemain alignment.</li> </ul> <p><b>Forcemain/Gravity Sewers – Bridge Street West</b></p> <ul style="list-style-type: none"> <li>▪ Temporary disruption during construction (noise, vibration, dust). Access to properties on Bridge Street West to be maintained, where possible.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Temporary disruption (noise) to current Susanna Moodie Elementary School north of the forcemain alignment.</li> </ul> <p><b>Forcemain/Gravity Sewers – Bridge Street West</b></p> <ul style="list-style-type: none"> <li>▪ Temporary disruption during construction (noise, vibration, dust). Access to properties on Bridge Street West to be maintained, where possible.</li> </ul>	<ul style="list-style-type: none"> <li>▪ If planned multi use path is constructed within easement, access may be temporarily blocked for active transportation users.</li> <li>▪ Temporary disruption (noise) to residential properties backing onto the north end of Avondale Road</li> </ul> <p><b>Forcemain/Gravity Sewers – Bridge Street West</b></p> <ul style="list-style-type: none"> <li>▪ Temporary disruption during construction (noise, vibration, dust). Access to properties on Bridge Street West to be maintained, where possible.</li> </ul>
	<p>Socio-economic Environment Potential Constraint Ranking</p>	<p><b>Low (More Preferred)</b></p>	<p><b>Low (More Preferred)</b></p>	<p><b>Medium (Moderately Preferred)</b></p>

**TABLE 2: Avonlough Forcemain/Gravity/Pressure Sewer Alignment West Side of Moira River**

Category & Criteria		Alignment 1: Potters Creek / Bridge Street West <small>*Applicable to alternative SPS Sites 1, 2, 3 and 5 only</small>	Alignment 2: Proposed Subdivision / Bridge Street West <small>*Applicable to alternative SPS Sites 1, 2, 3 and 5 only</small>	Alignment 3: Existing Forcemain Easement / Bridge Street West <small>*Applicable to alternative SPS Sites 1, 2, 3 and 5 only</small>
<b>CULTURAL ENVIRONMENT</b>	<b>1. Potential effects on archaeological resources</b>	<ul style="list-style-type: none"> <li>▪ High potential for the recovery of archaeological resources, given the undisturbed land, distance to potable water, soil texture and drainage and early Euro-Canadian settlement. Stage 2 Archaeological Assessment will be required.</li> </ul> <p><b>Forcemain/Gravity Sewers – Bridge Street West</b></p> <ul style="list-style-type: none"> <li>▪ Low potential for the recovery of archaeological resources based on works within existing disturbed right-of-way.</li> </ul>	<ul style="list-style-type: none"> <li>▪ High potential for the recovery of archaeological resources, given the undisturbed land, distance to potable water, soil texture and drainage and early Euro-Canadian settlement. Stage 2 Archaeological Assessment will be required.</li> </ul> <p><b>Forcemain/Gravity Sewers – Bridge Street West</b></p> <ul style="list-style-type: none"> <li>▪ Low potential for the recovery of archaeological resources based on works within existing disturbed right-of-way.</li> </ul>	<ul style="list-style-type: none"> <li>▪ High potential for the recovery of archaeological resources, given the undisturbed land, distance to potable water, soil texture and drainage and early Euro-Canadian settlement. Stage 2 Archaeological Assessment will be required.</li> </ul> <p><b>Forcemain/Gravity Sewers – Bridge Street West</b></p> <ul style="list-style-type: none"> <li>▪ Low potential for the recovery of archaeological resources based on works within existing disturbed right-of-way.</li> </ul>
	<b>2. Potential for disruption of built heritage resources</b>	<ul style="list-style-type: none"> <li>▪ Low potential – alignment west of Marshall Road avoids known built heritage resources.</li> </ul> <p><b>Forcemain/Gravity Sewers – Bridge Street West</b></p> <ul style="list-style-type: none"> <li>▪ Alignment includes designated heritage property at 110 Bridge Street West. Potential for indirect impacts (e.g. vibration).</li> </ul>	<ul style="list-style-type: none"> <li>▪ Low potential – alignment west of Marshall Road avoids known built heritage resources.</li> </ul> <p><b>Forcemain/Gravity Sewers – Bridge Street West</b></p> <ul style="list-style-type: none"> <li>▪ Alignment includes designated heritage property at 110 Bridge Street West. Potential for indirect impacts (e.g. vibration).</li> </ul>	<ul style="list-style-type: none"> <li>▪ Low potential – alignment west of Marshall Road avoids known built heritage resources.</li> </ul> <p><b>Forcemain/Gravity Sewers – Bridge Street West</b></p> <ul style="list-style-type: none"> <li>▪ Alignment includes designated heritage property at 110 Bridge Street West. Potential for indirect impacts (e.g. vibration).</li> </ul>
	<b>Cultural Environment Potential Constraint Ranking</b>	<b>Medium (Moderately Preferred)</b>	<b>Medium (Moderately Preferred)</b>	<b>Medium (Moderately Preferred)</b>

**TABLE 2: Avonlough Forcemain/Gravity/Pressure Sewer Alignment West Side of Moira River**

Category & Criteria		Alignment 1: Potters Creek / Bridge Street West <small>*Applicable to alternative SPS Sites 1, 2, 3 and 5 only</small>	Alignment 2: Proposed Subdivision / Bridge Street West <small>*Applicable to alternative SPS Sites 1, 2, 3 and 5 only</small>	Alignment 3: Existing Forcemain Easement / Bridge Street West <small>*Applicable to alternative SPS Sites 1, 2, 3 and 5 only</small>
COST	<b>1. Cost of construction</b>	<ul style="list-style-type: none"> <li>▪ SPS Alternative 1, 861 m of forcemain to Marshall Rd. to Bridge St. W. \$1.3M.</li> <li>▪ SPS Alternative 2, 777 m of forcemain to Marshall Rd. to Bridge St. W. \$1.2M.</li> <li>▪ SPS Alternative 3, 433 m of forcemain to Marshall Rd. to Bridge St. W. \$671K.</li> <li>▪ SPS Alternative 5, 804 m of forcemain to Marshall Rd. to Bridge St. W. \$1.3M.</li> </ul> <p><b>Forcemain/Gravity Sewers – Bridge Street West from Marshall Road to Coleman Street</b></p> <ul style="list-style-type: none"> <li>▪ This section of sewer cost identical for all alignments.</li> <li>▪ 827 m of forcemain, 1406 m of gravity sewer and 330 m of pressure sewer.</li> </ul>	<ul style="list-style-type: none"> <li>▪ SPS Alternative 1, 920 m of forcemain to Marshall Rd. to Bridge St. W. \$1.4M.</li> <li>▪ SPS Alternative 2, 836 m of forcemain to Marshall Rd. to Bridge St. W. \$1.3M.</li> <li>▪ SPS Alternative 3, 479 m of forcemain to Marshall Rd. to Bridge St. W. \$742K.</li> <li>▪ SPS Alternative 5, 861 m of forcemain to Marshall Rd. to Bridge St. W. \$1.3M.</li> </ul> <p>Note: proposed subdivision road network is not set and lengths could change based on an approved draft plan of subdivision.</p> <p><b>Forcemain/Gravity Sewers – Bridge Street West from Marshall Road to Coleman Street</b></p> <ul style="list-style-type: none"> <li>▪ This section of sewer cost identical for all alignments.</li> <li>▪ 827 m of forcemain, 1406 m of gravity sewer and 330 m of pressure sewer.</li> </ul>	<ul style="list-style-type: none"> <li>▪ SPS Alternative 1, 982 m of forcemain to Marshall Rd. to Bridge St. W. \$1.5M.</li> <li>▪ SPS Alternative 2, 898 m of forcemain to Marshall Rd. to Bridge St. W. \$1.4M.</li> <li>▪ SPS Alternative 3, 715 m of forcemain to Marshall Rd. to Bridge St. W. \$1.1M.</li> <li>▪ SPS Alternative 5, 1142 m of forcemain to Marshall Rd. to Bridge St. W. \$1.8M.</li> </ul> <p><b>Forcemain/Gravity Sewers – Bridge Street West from Marshall Road to Coleman Street</b></p> <ul style="list-style-type: none"> <li>▪ This section of sewer cost identical for all alignments.</li> <li>▪ 827 m of forcemain, 1406 m of gravity sewer and 330 m of pressure sewer.</li> </ul>
	<b>2. Cost Vs. Weighted ranking for implementation with any SPS Alternative</b>	<ul style="list-style-type: none"> <li>▪ Very compatible with SPS Alternative 1, 2, 3 and 5 with an alignment either side of the creek.</li> <li>▪ SPS Alternative site 4 is not applicable to this alignment.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Very compatible with SPS Alternative 1, 2, 3 and 5 with an alignment either side of the creek.</li> <li>▪ SPS Alternative site 4 is not applicable to this alignment.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Very compatible with SPS Alternative 1, 2, 3 and 5 with an alignment either side of the creek.</li> <li>▪ SPS Alternative site 4 is not applicable to this alignment.</li> </ul>
	<b>Cost Potential Constraint Ranking</b>	<b>Low (More Preferred)</b>	<b>Medium (Moderately Preferred)</b>	<b>Medium (Moderately Preferred)</b>

TABLE 2: Avonlough Forcemain/Gravity/Pressure Sewer Alignment West Side of Moira River

## Table 2: Summary of Evaluation

The table below provides a summary version of the detailed evaluation presented above. Alignment 4 was not carried over for evaluation purposes as it is not compatible with the preliminary recommended SPS Alternative Site 5. Alignment 3 is preferred with the lowest overall potential constraints.

Category	Alignment 1 <small>*Applicable to alternative SPS Sites 1, 2, 3 and 5 only</small>	Alignment 2 <small>*Applicable to alternative SPS Sites 1, 2, 3 and 5 only</small>	Alignment 3 <small>*Applicable to alternative SPS Sites 1, 2, 3 and 5 only</small>
Land Use	Medium (Moderately Preferred)	Medium (Moderately Preferred)	Low (More Preferred)
Technical	Low (More Preferred)	Medium (Moderately Preferred)	Low (More Preferred)
Natural Environment	High (Less Preferred)	High (Less Preferred)	Low (More Preferred)
Socio-Economic Environment	Low (More Preferred)	Low (More Preferred)	Medium (Moderately Preferred)
Cultural Environment	Medium (Moderately Preferred)	Medium (Moderately Preferred)	Medium (Moderately Preferred)
Cost	Low (More Preferred)	Medium (Moderately Preferred)	Medium (Moderately Preferred)
Alignment Evaluation – Overall Potential Constrain Ranking	Medium (Moderately Preferred Alignment)	High (Less Preferred Alignment)	Low (More Preferred Alignment)

**TABLE 3: Avonlough SPS Pressure Sewer – Moira River Crossing Options**

<b>Category &amp; Criteria</b>		<b>Option 1 Bridge Street Trenchless</b>	<b>Option 2 Market Street Trenchless</b>	<b>Option 3 Dundas Street Bridge On Structure</b>	<b>Option 4 North of Dundas Street Trenchless</b>	<b>Option 5 South of CPR Bridge Trenchless</b>
<b>Route Details</b>		<ul style="list-style-type: none"> <li>Starts on west side of Moira River at Bridge Street/Highland Avenue</li> <li>Ends on east side of Moira River at Dundas Street East/Pinnacle Street</li> <li>Trenchless – requires tunnel shafts on east and west side of Moira River</li> </ul>	<ul style="list-style-type: none"> <li>Starts on west side of Moira River at Bridge Street/Highland Avenue</li> <li>Ends on east side of Moira River at Dundas Street East/Pinnacle Street</li> <li>Trenchless – requires tunnel shafts on east and west side of Moira River</li> </ul>	<ul style="list-style-type: none"> <li>Starts on west side of Moira River at Bridge Street/Highland Avenue</li> <li>Ends on east side of Moira River at Dundas Street East/Pinnacle Street</li> <li>On-Structure – attach new pressure sewer pipe to the Dundas Street Bridge.</li> </ul>	<ul style="list-style-type: none"> <li>Starts on west side of Moira River at Bridge Street/Highland Avenue</li> <li>Ends on east side of Moira River at Dundas Street East/Pinnacle Street</li> <li>Trenchless – requires tunnel shafts on east and west side of Moira River</li> </ul>	<ul style="list-style-type: none"> <li>Starts on west side of Moira River at Bridge Street/Highland Avenue</li> <li>Ends on east side of Moira River at Dundas Street East/Pinnacle Street</li> <li>Trenchless – requires tunnel shafts on east and west side of Moira River</li> </ul>
<b>LAND USE</b>	<b>1. Potential effects on existing or approved/planned land uses.</b>	<ul style="list-style-type: none"> <li>Trenchless - Temporary displacement of land use related to tunnel shaft compounds.</li> <li>No effects to approved/future land uses identified at this time.</li> </ul>	<ul style="list-style-type: none"> <li>Trenchless - Temporary displacement of land use related to tunnel shaft compounds.</li> <li>No effects to approved/future land uses identified at this time. Possible coordination with planned redevelopment of the parking lot on the east side of the river.</li> </ul>	<ul style="list-style-type: none"> <li>On-Structure – avoids displacement of land for tunnel shafts</li> <li>No effects to approved/future land uses identified at this time.</li> </ul>	<ul style="list-style-type: none"> <li>Trenchless - Temporary displacement of land use related to tunnel shaft compounds.</li> <li>No effects to approved/future land uses identified at this time.</li> </ul>	<ul style="list-style-type: none"> <li>Trenchless - Temporary displacement of land use related to tunnel shaft compounds.</li> <li>No effects to approved/future land uses identified at this time.</li> </ul>
	<b>2. Potential for conforming with approved local, and provincial plans and policies.</b>	<ul style="list-style-type: none"> <li>Conforms with local and provincial approved plans and policies – utility is permitted use within right-of-way.</li> </ul>	<ul style="list-style-type: none"> <li>Conforms with local and provincial approved plans and policies – utility is permitted use within right-of-way.</li> </ul>	<ul style="list-style-type: none"> <li>Conforms with local and provincial approved plans and policies – utility is permitted use within right-of-way.</li> </ul>	<ul style="list-style-type: none"> <li>Conforms with local and provincial approved plans and policies – utility is permitted use within right-of-way.</li> </ul>	<ul style="list-style-type: none"> <li>Conforms with local and provincial approved plans and policies – utility is permitted use within right-of-way.</li> </ul>
<b>Land Use Potential Constraint Ranking</b>		<b>Medium (Moderately Preferred)</b>	<b>Medium (Moderately Preferred)</b>	<b>Low (More Preferred)</b>	<b>Medium (Moderately Preferred)</b>	<b>Medium (Moderately Preferred)</b>

**TABLE 3: Avonlough SPS Pressure Sewer – Moira River Crossing Options**

<b>Category &amp; Criteria</b>		<b>Option 1 Bridge Street Trenchless</b>	<b>Option 2 Market Street Trenchless</b>	<b>Option 3 Dundas Street Bridge On Structure</b>	<b>Option 4 North of Dundas Street Trenchless</b>	<b>Option 5 South of CPR Bridge Trenchless</b>
<b>TECHNICAL</b>	<b>1. Constructability</b> <ul style="list-style-type: none"> <li>▪ <b>Anticipated Ground Material</b></li> <li>▪ <b>Available property for staging (Launching and receiving shafts)</b></li> <li>▪ <b>Flood Risk</b></li> </ul>	<ul style="list-style-type: none"> <li>▪ Only location for staging is on Bridge Street.</li> <li>▪ Pressure sewer within a liner pipe would be found within bedrock.</li> <li>▪ Major depth requirement to clear existing/ future bridge foundations.</li> <li>▪ Shafts at the edge of the river are outside the regulatory floodline.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Limited space on west side of river for staging.</li> <li>▪ Opportunity to launch from City open space on the west to a City owned parking lot (future park).</li> <li>▪ Pressure sewer within a liner pipe would be found within bedrock.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Staging area to be coordinated with proposed construction of Dundas St. Bridge widening.</li> <li>▪ Potential limitations due to proximity to CPR tracks.</li> <li>▪ Open cut work on the west side of the river would be in a steep embankment.</li> <li>▪ On-structure option requires extensive setup to attach the pipes. This should be coordinated with the construction of the bridge upgrades.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Limited space for staging east and west of the river.</li> <li>▪ Potential property acquisition required at the northwest corner of Coleman St. and Dundas St. W. for a launching shaft. Avoids full closure of Coleman St.</li> <li>▪ City to advise on planned development of vacant property on Coleman St.</li> <li>▪ Pressure sewer within a liner pipe would be found within bedrock.</li> </ul>	<ul style="list-style-type: none"> <li>▪ City does not own the property west of the river in this location.</li> <li>▪ Potential property acquisition required on the west side of the river for a launching shaft. Currently owned by the marina.</li> <li>▪ Widest span of all options for crossing the river.</li> <li>▪ Potential to fill material within man-made sections of the Moira River outlet.</li> <li>▪ Frazzle ice to be considered for potential flood risks.</li> <li>▪ Shafts would need to be set back from the river to clear the regulatory floodline.</li> </ul>
	<b>2. Impact on operations and maintenance.</b>	<ul style="list-style-type: none"> <li>▪ Launching and receiving manholes will require lane closure or traffic control to access for inspection.</li> <li>▪ Trenchless installation provides difficulties for making repairs.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Launching and receiving manholes will be easily accessible with no lane closure or traffic control depending on the final decision on location. (Park vs. Market St.).</li> <li>▪ Trenchless installation provides difficulties for making repairs.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Manholes will be easily accessible on either side of the crossing with no lane closure or traffic control.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Launching and receiving manholes will require lane closure or traffic control to access for inspection.</li> <li>▪ Trenchless installation provides difficulties for making repairs.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Launching and receiving manholes will be easily accessible with no lane closure or traffic control.</li> <li>▪ Trenchless installation provides difficulties for making repairs.</li> </ul>
	<b>3. Future infrastructure coordination opportunities or implementation risks.</b>	<ul style="list-style-type: none"> <li>▪ Reconstruction of the bridge at Bridge Street is not within the required implementation of this crossing.</li> <li>▪ Not favorable to tunnel directly under a structure. Presents possible risks and limitations for the design of replacement bridge (~10 years away).</li> <li>▪ Potentially the deepest of all options due to foundation clearance requirements.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Potential for a combination utility tunnel to house the new pressure sewers, a replacement watermain currently crossing the river to north and any other utilities requiring a means of crossing the river.</li> <li>▪ Possible coordination with planned redevelopment of the parking lot on the east side of the river.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Opportunity to coordinate with the construction of a new pedestrian bridge.</li> <li>▪ Similar timeline anticipated for construction of the bridge upgrade and sewer.</li> <li>▪ On-structure option allows for easier repairs/ maintenance versus a trenchless installation.</li> </ul>	<ul style="list-style-type: none"> <li>▪ No coordination opportunities at this time.</li> </ul>	<ul style="list-style-type: none"> <li>▪ No coordination opportunities at this time.</li> <li>▪ Unknow soil conditions due to possible man-made land features.</li> </ul>
	<b>4. Redundancy/ Interconnectivity Opportunity</b>	<ul style="list-style-type: none"> <li>▪ Opportunity for interconnection to the Moira River pressure sewer at manhole D north of Bridge St.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Opportunity for interconnection to the Moira River pressure sewer at manhole B or C between Bridge St. and Dundas St. E.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Opportunity for interconnection to the Moira River pressure sewer at manhole A south of Dundas St. E. or directly to the existing Front Street pumping station</li> </ul>	<ul style="list-style-type: none"> <li>▪ Opportunity for interconnection to the Moira River pressure sewer at manhole A or B north and south of Dundas St. E.</li> </ul>	<ul style="list-style-type: none"> <li>▪ No interconnection opportunities available with the Moira River pressure sewer.</li> </ul>
	<b>5. Traffic impacts during construction, including expected lane/sidewalk closures and disruption to public transit.</b>	<ul style="list-style-type: none"> <li>▪ Trenchless – requires closure of bridge street for shaft construction and staging.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Trenchless – minimal impacts to traffic, possible disruption to Coleman St.</li> <li>▪ Opportunity to situate launching and receiving shafts outside of City roadways. Potential closure of Market St. depending on length of trenchless run.</li> </ul>	<ul style="list-style-type: none"> <li>▪ On Structure – significant impacts to traffic related to temporary lane closures on Dundas St.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Trenchless – significant impacts to traffic related to temporary lane closures on Coleman St. at Dundas St.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Trenchless – minimizes impacts to traffic.</li> </ul>
	<b>Technical Potential Constraint Ranking</b>	<b>High (Less Preferred)</b>	<b>Low (More Preferred)</b>	<b>Medium (Moderately Preferred)</b>	<b>Medium (Moderately Preferred)</b>	<b>Medium (Moderately Preferred)</b>

**TABLE 3: Avonlough SPS Pressure Sewer – Moira River Crossing Options**

Category & Criteria	Option 1 Bridge Street Trenchless	Option 2 Market Street Trenchless	Option 3 Dundas Street Bridge On Structure	Option 4 North of Dundas Street Trenchless	Option 5 South of CPR Bridge Trenchless
<p><b>1. Potential effects on terrestrial/aquatic habitat and species.</b></p> <p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>NATURAL ENVIRONMENT</b></p>	<p><b>Terrestrial Environment</b></p> <ul style="list-style-type: none"> <li>▪ There are no Areas of Natural or Scientific Interest (ANSIs), Provincially or Locally Significant Wetlands (PSWs or LSWs), unevaluated wetlands, significant woodlands or environmentally significant areas within 120 m of Option 1.</li> <li>▪ Little to no vegetation communities or wildlife habitats are present. Impacts will be limited to street trees or landscape vegetation, if required for entry and exit points for trenchless method.</li> <li>▪ Six Species of Conservation Concern (SOCC) have a medium potential of occurring within 120 m of this option.</li> <li>▪ Sensitive wildlife restrictive timing for vegetation/tree removal will apply, such as outside of the breeding bird season (April 1 to August 31).</li> </ul> <p><b>Aquatic Environment</b></p> <ul style="list-style-type: none"> <li>▪ Option 1 overlaps Moira River; however, trenchless methods are anticipated to avoid in-water work. Effects to fish and fish habitat are anticipated to be limited to potential impacts associated with work near water including the following: <ul style="list-style-type: none"> <li>○ Potential changes in sediment and / or contaminant concentrations in the event of the release of sediment and / or deleterious substances to the watercourse.</li> <li>○ Potential changes to habitat structure, instream and / or canopy cover as a result of the removal and / or alteration of riparian vegetation.</li> <li>○ Potential for changes in baseflow or water temperatures as a result of alterations of groundwater flows to surface water and / or changes in slope or drainage.</li> <li>○ Potential changes in food and / or nutrient concentrations as a result of the removal and / or alteration of riparian vegetation.</li> </ul> </li> </ul>	<p><b>Terrestrial Environment</b></p> <ul style="list-style-type: none"> <li>▪ There are no ANSIs, PSWs, LSWs, unevaluated wetlands, significant woodlands or environmentally significant areas within 120 m of Option 2.</li> <li>▪ Little to no vegetation communities or wildlife habitats are present. Impacts will be limited to street trees or landscape vegetation, if required for entry and exit points for trenchless method.</li> <li>▪ Six Species of Conservation Concern (SOCC) have a medium potential of occurring within 120 m of this option.</li> <li>▪ Sensitive wildlife restrictive timing for vegetation/tree removal will apply, such as outside of the breeding bird season (April 1 to August 31).</li> </ul> <p><b>Aquatic Environment</b></p> <ul style="list-style-type: none"> <li>▪ Option 2 overlaps Moira River; however, trenchless methods are anticipated to avoid in-water work. Effects to fish and fish habitat are anticipated to be limited to potential impacts associated with work near water including the following: <ul style="list-style-type: none"> <li>○ Potential changes in sediment and / or contaminant concentrations in the event of the release of sediment and / or deleterious substances to the watercourse.</li> <li>○ Potential changes to habitat structure, instream and / or canopy cover as a result of the removal and / or alteration of riparian vegetation.</li> <li>○ Potential for changes in baseflow or water temperatures as a result of alterations of groundwater flows to surface water and / or changes in slope or drainage.</li> <li>○ Potential changes in food and / or nutrient concentrations as a result of the removal and / or alteration of riparian vegetation.</li> </ul> </li> </ul>	<p><b>Terrestrial Environment</b></p> <ul style="list-style-type: none"> <li>▪ There are no ANSIs, PSWs, LSWs, unevaluated wetlands, significant woodlands or environmentally significant areas within 120 m of Option 3.</li> <li>▪ Little to no vegetation communities or wildlife habitats are present. Impacts will be limited to street trees or landscape vegetation, if required for construction.</li> <li>▪ Dundas Street Bridge may provide nesting habitat for some breeding birds protected under the Migratory Bird Convention Act, 1994 (MBCA).</li> <li>▪ Six Species of Conservation Concern (SOCC) have a medium potential of occurring within 120 m of this option.</li> <li>▪ Sensitive wildlife restrictive timing for vegetation/tree removal will apply, such as outside of the breeding bird season (April 1 to August 31).</li> </ul> <p><b>Aquatic Environment</b></p> <ul style="list-style-type: none"> <li>▪ Option 3 overlaps Moira River; however, overhead methods are anticipated to avoid in-water work. Effects to fish and fish habitat are anticipated to be limited to potential impacts associated with work near water including the following: <ul style="list-style-type: none"> <li>○ Potential changes in sediment and / or contaminant concentrations in the event of the release of sediment and / or deleterious substances to the watercourse.</li> <li>○ Potential changes to habitat structure, instream and / or canopy cover as a result of the removal and / or alteration of riparian vegetation.</li> <li>○ Potential for changes in baseflow or water temperatures as a result of alterations of groundwater flows to surface water and / or changes in slope or drainage.</li> <li>○ Potential changes in food and / or nutrient concentrations as a result of the removal and / or alteration of riparian vegetation.</li> </ul> </li> </ul>	<p><b>Terrestrial Environment</b></p> <ul style="list-style-type: none"> <li>▪ There are no ANSIs, PSWs, LSWs, unevaluated wetlands, significant woodlands or environmentally significant areas within 120 m of Option 4.</li> <li>▪ Little to no vegetation communities or wildlife habitats are present. Impacts will be limited to street trees or landscape vegetation, if required for entry and exit points for trenchless method.</li> <li>▪ Six Species of Conservation Concern (SOCC) have a medium potential of occurring within 120 m of this option.</li> <li>▪ Sensitive wildlife restrictive timing for vegetation/tree removal will apply, such as outside of the breeding bird season (April 1 to August 31).</li> </ul> <p><b>Aquatic Environment</b></p> <ul style="list-style-type: none"> <li>▪ Option 4 overlaps Moira River; however, trenchless methods are anticipated to avoid in-water work. Effects to fish and fish habitat are limited to potential impacts associated with work near water including the following: <ul style="list-style-type: none"> <li>○ Potential changes in sediment and / or contaminant concentrations in the event of the release of sediment and / or deleterious substances.</li> <li>○ Potential changes to habitat structure, instream and / or canopy cover as a result of the removal and / or alteration of riparian vegetation.</li> <li>○ Potential for changes in baseflow or water temperatures as a result of alterations of groundwater flows to surface water and / or changes in slope or drainage.</li> <li>○ Potential changes in food and / or nutrient concentrations as a result of the removal and / or alteration of riparian vegetation.</li> </ul> </li> </ul>	<p><b>Terrestrial Environment</b></p> <ul style="list-style-type: none"> <li>▪ There are no ANSIs, PSWs, LSWs, unevaluated wetlands, significant woodlands or environmentally significant areas within 120 m of Option 5.</li> <li>▪ Little to no vegetation communities or wildlife habitats are present. Impacts will be limited to street trees or landscape vegetation, if required for entry and exit points for trenchless method.</li> <li>▪ Six Species of Conservation Concern (SOCC) have a medium potential of occurring within 120 m of this option.</li> <li>▪ Sensitive wildlife restrictive timing for vegetation/tree removal will apply, such as outside of the breeding bird season (April 1 to August 31).</li> </ul> <p><b>Aquatic Environment</b></p> <ul style="list-style-type: none"> <li>▪ Option 5 overlaps Moira River; however, trenchless methods are anticipated to avoid in-water work. Effects to fish and fish habitat are limited to potential impacts associated with work near water including the following: <ul style="list-style-type: none"> <li>○ Potential changes in sediment and / or contaminant concentrations in the event of the release of sediment and / or deleterious substances</li> <li>○ Potential changes to habitat structure, instream and / or canopy cover as a result of the removal and / or alteration of riparian vegetation</li> <li>○ Potential for changes in baseflow or water temperatures as a result of alterations of groundwater flows to surface water and / or changes in slope or drainage</li> <li>○ Potential changes in food and / or nutrient concentrations as a result of the removal and / or alteration of riparian vegetation.</li> </ul> </li> </ul>

**TABLE 3: Avonlough SPS Pressure Sewer – Moira River Crossing Options**

Category & Criteria	Option 1 Bridge Street Trenchless	Option 2 Market Street Trenchless	Option 3 Dundas Street Bridge On Structure	Option 4 North of Dundas Street Trenchless	Option 5 South of CPR Bridge Trenchless
<p><b>2. Potential effects on Species at Risk (SAR) and their habitat.</b></p>	<p><b>Terrestrial Environment</b></p> <ul style="list-style-type: none"> <li>The following terrestrial SAR and their habitat may potentially occur in or within 120 m of the Alternative 1 based on identified ELC from aerial photo interpretation:                             <ul style="list-style-type: none"> <li>Threatened (THR): 3 (Barn Swallow, Chimney Swift and Blanding’s Turtle).</li> </ul> </li> </ul> <p><b>Aquatic Environment</b></p> <ul style="list-style-type: none"> <li>Moira River is designated as critical habitat for Channel Darter (Endangered [END] under the <i>Species at Risk Act</i>, 2002 [SARA] and Special Concern [SC] under the <i>Endangered Species Act</i>, 2007 [ESA]) and provides suitable habitat for American Eel (END under the ESA), Bridle Shiner (SC under both SARA and ESA) and Northern Sunfish (Special Concern under both SARA and ESA).</li> <li>Work near water could potentially result in effects (listed above) to fish and fish habitat (including SAR) without the application of mitigation and protection measures.</li> </ul>	<p><b>Terrestrial Environment</b></p> <ul style="list-style-type: none"> <li>The following terrestrial SAR and their habitat may potentially occur in or within 120 m of the Alternative 1 based on identified ELC from aerial photo interpretation:                             <ul style="list-style-type: none"> <li>Threatened (THR): 3 (Barn Swallow, Chimney Swift and Blanding’s Turtle).</li> </ul> </li> </ul> <p><b>Aquatic Environment</b></p> <ul style="list-style-type: none"> <li>Moira River is designated as critical habitat for Channel Darter (END under the SARA and SC under the ESA) and provides suitable habitat for American Eel (END under the ESA), Bridle Shiner (SC under SARA and ESA) and Northern Sunfish (SC under SARA and ESA).</li> <li>Work near water could potentially result in effects (listed above) to fish and fish habitat (including SAR) without the application of mitigation and protection measures.</li> </ul>	<p><b>Terrestrial Environment</b></p> <ul style="list-style-type: none"> <li>The following terrestrial SAR and their habitat may potentially occur in or within 120 m of the Alternative 1 based on identified ELC from aerial photo interpretation:                             <ul style="list-style-type: none"> <li>Threatened (THR): 3 (Barn Swallow, Chimney Swift and Blanding’s Turtle).</li> </ul> </li> <li>The Dundas Street Bridge may provide nesting habitat for Barn Swallow (Threatened under the Endangered Species Act, 2007). Construction on the bridge may result in habitat loss, displacement or disturbance of Barn Swallows.</li> </ul> <p><b>Aquatic Environment</b></p> <ul style="list-style-type: none"> <li>Moira River is designated as critical habitat for Channel Darter (END under the SARA and SC under the ESA) and provides suitable habitat for American Eel (END under the ESA), Bridle Shiner (SC under SARA and ESA) and Northern Sunfish (SC under SARA and ESA).</li> <li>Work near water could potentially result in effects (listed above) to fish and fish habitat (including SAR) without the application of mitigation and protection measures.</li> </ul>	<p><b>Terrestrial Environment</b></p> <ul style="list-style-type: none"> <li>The following terrestrial SAR and their habitat may potentially occur in or within 120 m of the Alternative 1 based on identified ELC from aerial photo interpretation:                             <ul style="list-style-type: none"> <li>Threatened (THR): 3 (Barn Swallow, Chimney Swift and Blanding’s Turtle).</li> </ul> </li> </ul> <p><b>Aquatic Environment</b></p> <ul style="list-style-type: none"> <li>Moira River is designated as critical habitat for Channel Darter (END under the SARA and SC under the ESA) and provides suitable habitat for American Eel (END under the ESA), Bridle Shiner (SC under SARA and ESA) and Northern Sunfish (SC under SARA and ESA).</li> <li>Work near water could potentially result in effects (listed above) to fish and fish habitat (including SAR) without the application of mitigation and protection measures.</li> </ul>	<p><b>Terrestrial Environment</b></p> <ul style="list-style-type: none"> <li>The following terrestrial SAR and their habitat may potentially occur in or within 120 m of the Alternative 1 based on identified ELC from aerial photo interpretation:                             <ul style="list-style-type: none"> <li>Threatened (THR): 3 (Barn Swallow, Chimney Swift and Blanding’s Turtle).</li> </ul> </li> </ul> <p><b>Aquatic Environment</b></p> <ul style="list-style-type: none"> <li>Moira River is designated as critical habitat for Channel Darter (END under the SARA and SC under the ESA) and provides suitable habitat for American Eel (END under the ESA), Bridle Shiner (SC under SARA and ESA) and Northern Sunfish (SC under SARA and ESA).</li> <li>Alternative 5 overlaps the Bay of Quinte (Lake Ontario), which provides suitable habitat for American Eel (END under the ESA), Grass Pickerel (SC under the SARA and ESA), Lake Sturgeon (END under the ESA), Rainbow Mussel (SC under SARA and ESA) and River Redhorse (SC under SARA and ESA).</li> <li>Work near water could potentially result in effects (listed above) to fish and fish habitat (including SAR) without the application of mitigation and protection measures.</li> </ul>
<p><b>3. Potential effects on surface water including source protection and groundwater.</b></p>	<ul style="list-style-type: none"> <li>Construction adjacent to Moira River.</li> <li>Anticipated Dewatering related to trenchless construction.</li> <li>Low risk to Intake Protection Zone (Located within IPZ 3)</li> <li>Located within limits of Highly Vulnerable Aquifer.</li> </ul>	<ul style="list-style-type: none"> <li>Construction adjacent to Moira River.</li> <li>Anticipated Dewatering related to trenchless construction.</li> <li>Anticipated Dewatering related to trenchless construction.</li> <li>Low risk to Intake Protection Zone (located within IPZ 3).</li> <li>Located within limits of Highly Vulnerable Aquifer.</li> </ul>	<ul style="list-style-type: none"> <li>Construction adjacent to Moira River.</li> <li>No dewatering if attach to structure.</li> <li>Low risk to Intake Protection Zone (located within IPZ 3).</li> <li>Located within limits of Highly Vulnerable Aquifer.</li> </ul>	<ul style="list-style-type: none"> <li>Construction adjacent to Moira River</li> <li>Anticipated Dewatering related to trenchless construction.</li> <li>Low risk to Intake Protection Zone (located within IPZ 3).</li> <li>Located within limits of Highly Vulnerable Aquifer.</li> </ul>	<ul style="list-style-type: none"> <li>Construction adjacent to Moira River</li> <li>Anticipated Dewatering related to trenchless construction.</li> <li>Low risk to Intake Protection Zone (located within IPZ 3)</li> <li>Located within limits of Highly Vulnerable Aquifer.</li> </ul>
<p><b>4. Potential to encounter soil and water contamination.</b></p>	<ul style="list-style-type: none"> <li>Moderate potential to encounter soil and water contamination.</li> </ul>	<ul style="list-style-type: none"> <li>Moderate potential to encounter soil and water contamination.</li> </ul>	<ul style="list-style-type: none"> <li>Moderate potential to encounter soil and water contamination.</li> </ul>	<ul style="list-style-type: none"> <li>Moderate potential to encounter soil and water contamination.</li> </ul>	<ul style="list-style-type: none"> <li>Moderate potential to encounter soil and water contamination.</li> </ul>

NATURAL ENVIRONMENT



**TABLE 3: Avonlough SPS Pressure Sewer – Moira River Crossing Options**

<b>Category &amp; Criteria</b>		<b>Option 1 Bridge Street Trenchless</b>	<b>Option 2 Market Street Trenchless</b>	<b>Option 3 Dundas Street Bridge On Structure</b>	<b>Option 4 North of Dundas Street Trenchless</b>	<b>Option 5 South of CPR Bridge Trenchless</b>
<b>NATURAL ENVIRONMENT</b>	<b>5. Anticipated environmental permitting and approval considerations.</b>	<ul style="list-style-type: none"> <li>▪ Trenchless – More complicated</li> <li>▪ DFO Request for Review / Authorization may be required if activities near or below the HWM of the Moira River could result in potential impacts to fish or fish habitat.</li> <li>▪ Permit/Authorization or Registration under the ESA may be required for potential SAR identified above.</li> <li>▪ Permit under SARA may be required if activities near the HWM could result in potential impacts to critical habitat for Channel Darter.</li> <li>▪ Permit application under O.Reg. 319/09.</li> <li>▪ Groundwater – dewatering and/or depressurization requirements and anticipated water flow volumes will be confirmed by geotechnical investigations completed in support of detailed design. The determination of which process should be followed (Permit to Take Water (PTTW) or Environmental Activity Sector Registry (EASR)) is based on the expected volume of taking during dewatering; takings between 50,000 L/d and 400,000 L/d are required to register for the EASR while takings above 400,000 L/d are regulated by the PTTW process. If significant dewatering is anticipated, a detailed groundwater management and monitoring plan will be required in support of the dewatering activities.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Trenchless - More complicated</li> <li>▪ DFO Request for Review / Authorization may be required if activities near or below the HWM of the Moira River could result in potential impacts to fish or fish habitat.</li> <li>▪ Permit/Authorization or Registration under the ESA may be required for potential SAR identified above.</li> <li>▪ Permit under SARA may be required if activities near or below the HWM could result in potential impacts to critical habitat for Channel Darter.</li> <li>▪ Permit application under O.Reg. 319/09.</li> <li>▪ Groundwater – dewatering and/or depressurization requirements and anticipated water flow volumes will be confirmed by geotechnical investigations completed in support of detailed design. The determination of which process should be followed (Permit to Take Water (PTTW) or Environmental Activity Sector Registry (EASR)) is based on the expected volume of taking during dewatering; takings between 50,000 L/d and 400,000 L/d are required to register for the EASR while takings above 400,000 L/d are regulated by the PTTW process. If significant dewatering is anticipated, a detailed groundwater management and monitoring plan will be required in support of the dewatering activities.</li> </ul>	<ul style="list-style-type: none"> <li>▪ On structure – Straight forward</li> <li>▪ DFO Request for Review / Authorization may be required if activities near or below the HWM of the Moira River could result in potential impacts to fish or fish habitat.</li> <li>▪ Permit/Authorization or Registration under the ESA may be required for potential SAR identified above.</li> <li>▪ Permit under SARA may be required if activities near or below the HWM could result in potential impacts to critical habitat for Channel Darter.</li> <li>▪ Permit application under O.Reg. 319/09.</li> <li>▪ If Barn Swallow nests are identified on Dundas street, an authorization under O.Reg. 242/08 of the Endangered Species Act, 2007 (ESA) may be required.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Trenchless - More complicated</li> <li>▪ DFO Request for Review / Authorization may be required if activities near or below the HWM of the Moira River could result in potential impacts to fish or fish habitat.</li> <li>▪ Permit under SARA may be required if activities near or below the HWM could result in potential impacts to critical habitat for Channel Darter.</li> <li>▪ Permit application under O.Reg. 319/09.</li> <li>▪ Permit/Authorization or Registration under the ESA may be required for potential SAR identified above.</li> <li>▪ Groundwater – dewatering and/or depressurization requirements and anticipated water flow volumes will be confirmed by geotechnical investigations completed in support of detailed design. The determination of which process should be followed (Permit to Take Water (PTTW) or Environmental Activity Sector Registry (EASR)) is based on the expected volume of taking during dewatering; takings between 50,000 L/d and 400,000 L/d are required to register for the EASR while takings above 400,000 L/d are regulated by the PTTW process. If significant dewatering is anticipated, a detailed groundwater management and monitoring plan will be required in support of the dewatering activities.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Trenchless - More complicated</li> <li>▪ DFO Request for Review / Authorization may be required if activities near or below the HWM of the Moira River could result in potential impacts to fish or fish habitat.</li> <li>▪ Permit under SARA may be required if activities near or below the HWM could result in potential impacts to critical habitat for Channel Darter.</li> <li>▪ Permit application under O.Reg. 319/09.</li> <li>▪ Permit/Authorization or Registration under the ESA may be required for potential SAR identified above.</li> <li>▪ Groundwater – dewatering and/or depressurization requirements and anticipated water flow volumes will be confirmed by geotechnical investigations completed in support of detailed design. The determination of which process should be followed (Permit to Take Water (PTTW) or Environmental Activity Sector Registry (EASR)) is based on the expected volume of taking during dewatering; takings between 50,000 L/d and 400,000 L/d are required to register for the EASR while takings above 400,000 L/d are regulated by the PTTW process. If significant dewatering is anticipated, a detailed groundwater management and monitoring plan will be required in support of the dewatering activities.</li> </ul>
	<b>Natural Environment Potential Constraint Ranking</b>	<b>Low (More Preferred)</b>	<b>Low (More Preferred)</b>	<b>Medium (Moderately Preferred)</b>	<b>Low (More Preferred)</b>	<b>Medium (Moderately Preferred)</b>

**TABLE 3: Avonlough SPS Pressure Sewer – Moira River Crossing Options**

<b>Category &amp; Criteria</b>		<b>Option 1 Bridge Street Trenchless</b>	<b>Option 2 Market Street Trenchless</b>	<b>Option 3 Dundas Street Bridge On Structure</b>	<b>Option 4 North of Dundas Street Trenchless</b>	<b>Option 5 South of CPR Bridge Trenchless</b>
<b>SOCIO-ECONOMIC ENVIRONMENT</b>	<b>1. Potential effects related to the enjoyment and use of property including disruption to residences, institutions, businesses, recreational facilities during construction (noise, vibration, dust, access).</b>	<ul style="list-style-type: none"> <li>▪ Temporary impacts related to construction at tunnel shaft compounds (lane closures)</li> <li>▪ Temporary effects anticipated for noise, vibration, dust and access.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Temporary impacts related to Trenchless construction (loss of park-open space and downtown parking spaces at tunnel shaft compounds).</li> <li>▪ Temporary effects anticipated for noise, vibration and dust.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Temporary impacts related to construction on and beside bridge (bridge lane closures may reduce access to local downtown businesses and other uses).</li> <li>▪ Temporary effects anticipated for noise, vibration and dust.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Temporary impacts related to construction at tunnel shaft compounds.</li> <li>▪ Potential restriction of access to downtown.</li> <li>• Temporary effects anticipated for noise, vibration and dust.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Temporary impacts related to construction (disruption to Belleville Harbour marinas, businesses and Victoria Park).</li> <li>▪ Temporary effects anticipated for noise, vibration and dust.</li> </ul>
	<b>Socio-economic Environment Potential Constraint Ranking</b>	<b>Low (More Preferred)</b>	<b>Low (More Preferred)</b>	<b>Medium (Moderately Preferred)</b>	<b>Medium (Moderately Preferred)</b>	<b>High (Less Preferred)</b>

**TABLE 3: Avonlough SPS Pressure Sewer – Moira River Crossing Options**

<b>Category &amp; Criteria</b>		<b>Option 1 Bridge Street Trenchless</b>	<b>Option 2 Market Street Trenchless</b>	<b>Option 3 Dundas Street Bridge On Structure</b>	<b>Option 4 North of Dundas Street Trenchless</b>	<b>Option 5 South of CPR Bridge Trenchless</b>
<b>CULTURAL ENVIRONMENT</b>	<b>1. Potential effects on archaeological resources.</b>	<ul style="list-style-type: none"> <li>Low potential – the crossing option is within the disturbed right-of-way and includes areas previously assessed.</li> </ul>	<ul style="list-style-type: none"> <li>Low potential – the crossing option is within the disturbed right-of-way and includes areas previously assessed.</li> </ul>	<ul style="list-style-type: none"> <li>Low potential – the crossing option is within the disturbed right-of-way and includes areas previously assessed.</li> </ul>	<ul style="list-style-type: none"> <li>Low potential – the crossing option is within the disturbed right-of-way and includes areas previously assessed.</li> </ul>	<ul style="list-style-type: none"> <li>Higher potential compared to other options – Option 5 includes a segment of sewer within the partially undisturbed CPR corridor that would trigger a Stage 2 archaeological assessment.</li> </ul>
	<b>2. Potential for disruption of built heritage resources.</b>	<ul style="list-style-type: none"> <li>Crossing option is within the road right-of-way with known designated heritage properties. Potential for indirect impacts (e.g. vibration).</li> </ul>	<ul style="list-style-type: none"> <li>Crossing option is within the road right-of-way with known designated heritage properties. Potential for indirect impacts (e.g. vibration).</li> <li>Direct impacts to 160 Front Street- the Cablevue Façade, a designated Part IV property under the Ontario Heritage Act. Mitigation is required as per the Cultural Heritage Screening Memorandum.</li> </ul>	<ul style="list-style-type: none"> <li>Crossing option is within the road right-of-way with known designated heritage properties. Potential for indirect impacts (e.g. vibration).</li> </ul>	<ul style="list-style-type: none"> <li>Crossing option is within the road right-of-way with known designated heritage properties. Potential for indirect impacts (e.g. vibration). Potential need to relocate monument at northwest corner of Dundas St. E. and Front St.</li> </ul>	<ul style="list-style-type: none"> <li>Crossing option is within the road right-of-way with known designated heritage properties. Potential for indirect impacts (e.g. vibration).</li> </ul>
	<b>Cultural Environment Potential Constraint Ranking</b>	<b>Low (More Preferred)</b>	<b>Medium (Moderately Preferred)</b>	<b>Low (More Preferred)</b>	<b>Medium (Moderately Preferred)</b>	<b>High (Less Preferred)</b>

**TABLE 3: Avonlough SPS Pressure Sewer – Moira River Crossing Options**

<b>Category &amp; Criteria</b>		<b>Option 1 Bridge Street Trenchless</b>	<b>Option 2 Market Street Trenchless</b>	<b>Option 3 Dundas Street Bridge On Structure</b>	<b>Option 4 North of Dundas Street Trenchless</b>	<b>Option 5 South of CPR Bridge Trenchless</b>
<b>COST</b>	<b>1. Cost of construction (including property acquisition).</b>	<ul style="list-style-type: none"> <li>▪ No required property acquisition foreseen.</li> <li>▪ Launching and receiving shaft and minimum 83 m long tunnel. \$1.5M.</li> </ul>	<ul style="list-style-type: none"> <li>▪ No required property acquisition foreseen.</li> <li>▪ Launching and receiving shaft and minimum 113 m long tunnel. \$1.7M.</li> </ul>	<ul style="list-style-type: none"> <li>▪ No required property acquisition foreseen.</li> <li>▪ Mounted to structure. \$870K.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Potential property acquisition required at northwest corner Coleman St. and Dundas St. W. (Temporary for construction and permanent for launching shaft).</li> <li>▪ Possible requirement to move monument at northwest corner of Dundas St. E. and Front St to accommodate a receiving shaft. \$50K</li> <li>▪ Launching and receiving shaft and minimum 172 m long tunnel. \$2.1M.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Potential property acquisition required on west side of river, Crate's Marina (Temporary for construction and permanent for launching shaft).</li> <li>▪ Launching and receiving shaft minimum 183 m long tunnel. \$2.15M</li> </ul>
	<b>2. Cost of operations / maintenance.</b>	<ul style="list-style-type: none"> <li>▪ Accessibility and self-flushing of trenchless section under river less favorable than that of on-bridge options.</li> <li>▪ Insulation of trenchless section under river more favorable than that of on-bridge options.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Accessibility and self-flushing of trenchless section under river less favorable than that of on-bridge options.</li> <li>▪ Insulation of trenchless section under river more favorable than that of on-bridge options.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Accessibility and self-flushing of trenchless section under river less favorable than that of on-bridge options.</li> <li>▪ Insulation of trenchless section under river more favorable than that of on-bridge options.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Accessibility and self-flushing of trenchless section under river less favorable than that of on-bridge options.</li> <li>▪ Insulation of trenchless section under river more favorable than that of on-bridge options.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Accessibility and self-flushing of trenchless section under river less favorable than that of on-bridge options.</li> <li>▪ Insulation of trenchless section under river more favorable than that of on-bridge options.</li> </ul>
	<b>Cost Potential Constraint Ranking</b>	<b>Medium (Moderately Preferred)</b>	<b>Medium (Moderately Preferred)</b>	<b>Low (More Preferred)</b>	<b>High (Less Preferred)</b>	<b>High (Less Preferred)</b>

TABLE 3: Avonlough SPS Pressure Sewer – Moira River Crossing Options

### Table 3: Summary of Evaluation

The table below provides a summary version of the detailed evaluation presented above. Option 2 has the lowest overall potential constraints relative to the other options and is therefore, most preferred.

Category	Option 1	Option 2	Option 3	Option 4	Option 5
<b>Land Use</b>	Medium (Moderately Preferred)	Medium (Moderately Preferred)	Low (More Preferred)	Medium (Moderately Preferred)	Medium (Moderately Preferred)
<b>Technical</b>	High (Less Preferred)	Low (More Preferred)	Medium (Moderately Preferred)	Medium (Moderately Preferred)	Medium (Moderately Preferred)
<b>Natural Environment</b>	Low (More Preferred)	Low (More Preferred)	Medium (Moderately Preferred)	Low (More Preferred)	Medium (Moderately Preferred)
<b>Socio-Economic Environment</b>	Low (More Preferred)	Low (More Preferred)	Medium (Moderately Preferred)	Medium (Moderately Preferred)	High (Less Preferred)
<b>Cultural Environment</b>	Low (More Preferred)	Medium (Moderately Preferred)	Low (More Preferred)	Medium (Moderately Preferred)	High (Less Preferred)
<b>Cost</b>	Medium (Moderately Preferred)	Medium (Moderately Preferred)	Low (More Preferred)	High (Less Preferred)	High (Less Preferred)
<b>Moira River Crossing Option Evaluation – Overall Potential Constraint Ranking</b>	Medium (Moderately Preferred Option)	Low (More Preferred)	Medium (Moderately Preferred Option)	Medium (Moderately Preferred Option)	High (Less Preferred Option)

**TABLE 4: Avonlough Pressure Sewer Routing from East Side of Moira River to WWTP**

<b>Category &amp; Criteria</b>		<b>Route 1</b> Dundas/George St.	<b>Route 2</b> Pinnacle/St. Paul St.	<b>Route 3</b> Church/St. Paul St.	<b>Route 4</b> John St. S/St. Paul St.	<b>Route 5</b> Parallel to CPR Corridor
<b>Route Details from Intersection of Dundas Street and Pinnacle Street</b>		<ul style="list-style-type: none"> <li>East on Dundas St. to George St., South on George St. to the Waste Water Treatment Plan (WWTP).</li> </ul>	<ul style="list-style-type: none"> <li>South on Pinnacle St. to St. Paul St., East on St. Paul St. to George St., south on George St. to the WWTP.</li> </ul>	<ul style="list-style-type: none"> <li>East on Dundas St. to Church St., South on Church St. to St. Paul St., east on St. Paul Street to George St., south on George St. to the WWTP.</li> </ul>	<ul style="list-style-type: none"> <li>East on Dundas St. to John St. S, South on John St. S to St. Paul St., east on St. Paul Street to George St., south on George St. to the WWTP.</li> </ul>	<ul style="list-style-type: none"> <li>South from Dundas St. to the CPR corridor, east along the corridor to any north-south street. Continue to WWTP based on Route 1 through 4.</li> </ul>
<b>LAND USE</b>	<b>1. Potential effects on existing or approved/planned land uses.</b>	<ul style="list-style-type: none"> <li>None anticipated, all infrastructure to be installed within the existing road right-of-way.</li> </ul>	<ul style="list-style-type: none"> <li>None anticipated, all infrastructure to be installed within the existing road right-of-way.</li> </ul>	<ul style="list-style-type: none"> <li>None anticipated, all infrastructure to be installed within the existing road right-of-way.</li> </ul>	<ul style="list-style-type: none"> <li>None anticipated, all infrastructure to be installed within the existing road right-of-way.</li> </ul>	<ul style="list-style-type: none"> <li>Rail corridor is planned for expansion – pressure sewer would displace existing or approved land use.</li> </ul>
	<b>2. Potential for conforming with approved local, and provincial plans and policies.</b>	<ul style="list-style-type: none"> <li>Conforms with local and provincial approved plans and policies – utility is permitted use within right-of-way.</li> </ul>	<ul style="list-style-type: none"> <li>Conforms with local and provincial approved plans and policies – utility is permitted use within right-of-way.</li> <li>Route is subject to By-law Number 2020-21.</li> </ul>	<ul style="list-style-type: none"> <li>Conforms with local and provincial approved plans and policies – utility is permitted use within right-of-way.</li> <li>Route is subject to By-law Number 2020-21.</li> </ul>	<ul style="list-style-type: none"> <li>Conforms with local and provincial approved plans and policies – utility is permitted use within right-of-way.</li> </ul>	<ul style="list-style-type: none"> <li>Conforms with local and provincial approved plans and policies – utility is permitted use within right-of-way.</li> <li>Route is subject to By-law Number 2020-21.</li> </ul>
<b>Land Use Potential Constraint Ranking</b>		<b>Low (More Preferred)</b>	<b>Medium (Moderately Preferred)</b>	<b>Medium (Moderately Preferred)</b>	<b>Low (More Preferred)</b>	<b>High (Less Preferred)</b>

**TABLE 4: Avonlough Pressure Sewer Routing from East Side of Moira River to WWTP**

Category & Criteria		Route 1 Dundas/George St.	Route 2 Pinnacle/St. Paul St.	Route 3 Church/St. Paul St.	Route 4 John St. S/St. Paul St.	Route 5 Parallel to CPR Corridor
<b>TECHNICAL</b>	<b>1. Constructability</b> <ul style="list-style-type: none"> <li>Need minimum available 2.1 m wide Corridor (clear zone)</li> <li>Available property for staging</li> <li>Depth</li> <li>Distance from Watermains</li> </ul>	<ul style="list-style-type: none"> <li>North and south boulevard on Dundas St. E. are very narrow (approximately 2.0 m wide each).</li> <li>Alignment proposed along the south boulevard of Dundas St. E. from Front St. to Church St.</li> <li>3 m wide corridor available under Dundas West bound lane (WBL) 1, bordered by 150 mm gas main and 375 to 750 mm storm sewer.</li> <li>Adequate clearance between proposed twin sewer and watermain (WM).</li> <li>Dundas St. E is congested with storm sewers, sanitary sewers, watermain, gas main and Bell cable.</li> <li>3 m wide corridor available under George St. North bound lane (NBL) from Dundas St. E. to St. Paul St., and then east boulevard/ South bound lane (SBL) to the WWTP. Bordered by 50 mm gas main and 100 mm watermain and then 825 mm storm sewer and private property.</li> <li>Two WM crossings required on Dundas St. E. based on proposed alignment.</li> <li>No noted conflicts noted on George St. due to proximity to WM.</li> <li>Possible property acquisition required for construction of the sewers in the boulevards.</li> <li>Rail crossing required.</li> </ul>	<ul style="list-style-type: none"> <li>6 m wide corridor available on the SBL/West boulevard of Pinnacle St., bordered by 150 mm watermain and 1500 mm pressure sewer.</li> <li>Approximately 2.5 m of clearance between proposed sewer alignment and WM on Pinnacle St.</li> <li>Potential for WM to be relocated if replacement is required during road reconstruction.</li> <li>Corridor ranging from 3 m to 5 m available along the center line of St. Paul St. from Pinnacle St. to George St., bordered by 300 mm sanitary and 200 mm watermain.</li> <li>Existing sanitary force mains located in north and south boulevard of St. Paul St.</li> <li>Twin force main would be located close to existing watermain on St. Paul St.</li> <li>Rail crossing required.</li> <li>Corridor available on east boulevard of George St. to the WWTP, bordered by 825 mm storm sewer and private property.</li> <li>Sanitary force mains located in north and south boulevard of St. Paul St..</li> <li>Constructability concerns with the handling and disposal of contaminated materials as route is located within area subject to City's Health and Safety By-law Number 2020-21.</li> </ul>	<ul style="list-style-type: none"> <li>Corridor ranging from 3 m to 8 m available along the center line of Church St., bordered by 200 to 300 mm sanitary sewer and 150 to 200 mm storm leads.</li> <li>Corridor ranging from 3 m to 5 m available along the center line of St. Paul St. from Pinnacle St. to George St., bordered by 300 mm sanitary and 200 mm Watermain.</li> <li>Corridor available on east boulevard of George St. to the WWTP, bordered by 825 mm storm sewer and private property.</li> <li>Existing sanitary force mains located in north and south boulevard of St. Paul St.</li> <li>Twin force main would be located close to existing watermain on St. Paul St.</li> <li>Potential corridor located along north boulevard of St. Paul St. East of S. Church St.</li> <li>Rail crossing required.</li> <li>Corridor available on east boulevard of George St. to the WWTP, bordered by 825 mm storm and private property.</li> <li>Drawings indicate watermain (50 mm) located against side of 250 mm SAN on S. Church St.</li> <li>Constructability concerns with the handling and disposal of contaminated materials as route is located within area subject to City's Health and Safety By-law Number 2020-21..</li> </ul>	<ul style="list-style-type: none"> <li>Alignment proposed along the south boulevard of Dundas St. E. from Front St. to Church St., bordered by property line and duct bank.</li> <li>3 m wide corridor available under Dundas WBL1 from Church St. to John St. S., bordered by 150 mm gas main and 375 to 750 mm storm sewer. Ability to push the sewers inline with abandoned watermain along Dundas St. E. centerline to provide clearance from 200 mm WM.</li> <li>5 m corridor available along the west boulevard of S John St., bordered by private property and 150 mm watermain.</li> <li>Gas main and storm sewer located in east boulevard.</li> <li>Corridor ranging from 3m to 5 m available along the center line of St. Paul St. from Pinnacle to George, bordered by 300 mm sanitary sewer and 200 mm watermain.</li> <li>Potential opportunity to run parallel with existing 600 mm force main on south boulevard of St. Paul St. to provide adequate separation from WM.</li> <li>Corridor available on east boulevard of George St. to the WWTP, bordered by 825 mm storm sewer and private property.</li> <li>Existing sanitary force mains located in north and south boulevards of St. Paul St..</li> <li>Proposed twin force main would be located close to existing watermain on St. Paul St. and S John St.</li> <li>Rail crossing required.</li> </ul>	<ul style="list-style-type: none"> <li>Properties backing onto the corridor are anticipated to be clear of utilities.</li> <li>Approval from CPR anticipated for construction adjacent to the rail.</li> <li>Directional drilling is a viable option if property can be acquired.</li> <li>Favorable north-south route to be selected. John St. S. or George St. appear least congested south of the CPR corridor.</li> <li>Rail crossing required.</li> <li>Constructability concerns with the handling and disposal of contaminated materials as route is located within area subject to City's Health and Safety By-law Number 2020-21.</li> </ul>
	<b>2. Impact on operations and maintenance.</b>	<ul style="list-style-type: none"> <li>Locating the sewers under sidewalks on the boulevard could present challenges for access chambers and potential repairs.</li> <li>Dundas St. E increases in elevation moving west to east.</li> </ul>	<ul style="list-style-type: none"> <li>Locating the sewers under sidewalks on the boulevard could present challenges for access chambers and potential repairs.</li> </ul>	<ul style="list-style-type: none"> <li>Locating the sewers under sidewalks on the boulevard could present challenges for access chambers and potential repairs.</li> </ul>	<ul style="list-style-type: none"> <li>Locating the sewers under sidewalks on the boulevard could present challenges for access chambers and potential repairs.</li> </ul>	<ul style="list-style-type: none"> <li>Flagging might be required for future inspection or maintenance.</li> <li>Most direct route with minimal requirement for bends.</li> </ul>
	<b>3. Future infrastructure coordination opportunities or implementation risks.</b>	<ul style="list-style-type: none"> <li>Close proximity and crossing of existing utilities presents risk of possible damage during construction.</li> </ul>	<ul style="list-style-type: none"> <li>Installation of the twin sewer can be coordinated with the rehabilitation of Pinnacle St.</li> <li>Alignment is adjacent to potential historical industrial zoned land (potential to encounter contaminated soils/groundwater).</li> <li>Close proximity and crossing of existing utilities presents risk of possible damage during construction.</li> <li>Health and safety implementation risks – route is within area subject to By-law 2020-21.</li> </ul>	<ul style="list-style-type: none"> <li>Alignment is adjacent to potential historical industrial zoned land (potential to encounter contaminated soils/groundwater).</li> <li>Close proximity and crossing of existing utilities presents risk of possible damage during construction.</li> <li>Health and safety implementation risks – route is within area subject to By-law 2020-21.</li> </ul>	<ul style="list-style-type: none"> <li>Potential opportunity to connect S. John St. at the CPR tracks as a joint construction project.</li> <li>Close proximity and crossing of existing utilities presents risk of possible damage during construction.</li> </ul>	<ul style="list-style-type: none"> <li>Alignment is adjacent to potential historical industrial zoned land (potential to encounter contaminated soils/groundwater).</li> <li>Close proximity and crossing of existing utilities presents risk of possible damage during construction.</li> <li>Health and safety implementation risks – route is within area subject to By-law 2020-21.</li> </ul>

**TABLE 4: Avonlough Pressure Sewer Routing from East Side of Moira River to WWTP**

<b>Category &amp; Criteria</b>		<b>Route 1</b> Dundas/George St.	<b>Route 2</b> Pinnacle/St. Paul St.	<b>Route 3</b> Church/St. Paul St.	<b>Route 4</b> John St. S/St. Paul St.	<b>Route 5</b> Parallel to CPR Corridor
<b>TECHNICAL</b>	<b>4. Redundancy/ Interconnectivity Opportunity</b>	<ul style="list-style-type: none"> <li>▪ Twin sewer pipes allow for isolation of individual pipes for maintenance and repairs.</li> <li>▪ Interconnection chambers to be explored during the preliminary design phase.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Twin sewer pipes allow for isolation of individual pipes for maintenance and repairs.</li> <li>▪ Interconnection chambers to be explored during the preliminary design phase.</li> <li>▪ Proposed sewer alignment located in close proximity to an existing 18 inch and 24 inch pressure sewer. Possibility for an interconnection chamber.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Twin sewer pipes allow for isolation of individual pipes for maintenance and repairs.</li> <li>▪ Interconnection chambers to be explored during the preliminary design phase.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Twin sewer pipes allow for isolation of individual pipes for maintenance and repairs.</li> <li>▪ Interconnection chambers to be explored during the preliminary design phase.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Twin sewer pipes allow for isolation of individual pipes for maintenance and repairs.</li> <li>▪ Interconnection chambers to be explored during the preliminary design phase.</li> </ul>
	<b>5. Traffic impacts during construction, including expected lane/sidewalk closures and disruption to public transit.</b>	<ul style="list-style-type: none"> <li>▪ Major disturbance to traffic on Dundas St. E. compared to other routes.</li> <li>▪ Requires the closure of 2 lanes on Dundas St. E and potentially all of George from Dundas to St. Paul.</li> <li>▪ Potential mitigation by way of directional drilling in the boulevard (subject to feasibility of boring in close proximity to existing services).</li> </ul>	<ul style="list-style-type: none"> <li>▪ Moderate disturbance to traffic on Dundas St. E.</li> <li>▪ Minimum one lane and sidewalk of Pinnacle St. would need to be closed.</li> <li>▪ St. Paul St. would need to be completely closed for the construction.</li> <li>▪ Potential mitigation by way of directional drilling in the boulevard (subject to feasibility of boring in close proximity to existing services).</li> </ul>	<ul style="list-style-type: none"> <li>▪ Moderate disturbance to traffic on Dundas St. E.</li> <li>▪ Church St. would need to be completely closed for the construction.</li> <li>▪ St. Paul St. would need to be completely closed for the construction.</li> <li>▪ Potential mitigation by way of directional drilling in the boulevard (subject to feasibility of boring in close proximity to existing services).</li> </ul>	<ul style="list-style-type: none"> <li>▪ Moderate disturbance to traffic on Dundas St. E.</li> <li>▪ Potentially one lane of John St. would need to be closed. Directional drilling can help maintain access.</li> <li>▪ St. Paul would need to be completely closed for the construction.</li> <li>▪ Potential mitigation by way of directional drilling in the boulevard (subject to feasibility of boring in close proximity to existing services).</li> </ul>	<ul style="list-style-type: none"> <li>▪ No impact to traffic other than a section of George St. that would need to be closed from the CPR tracks to St. Paul St.</li> <li>▪ Potential mitigation by way of directional drilling in the boulevard (subject to feasibility of boring in close proximity to existing services).</li> <li>▪ Potentially requires rail flagging for the duration of the installation along the corridor.</li> </ul>
	<b>Technical Potential Constraint Ranking</b>	<b>Medium (Moderately Preferred)</b>	<b>High (Less Preferred)</b>	<b>High (Less Preferred)</b>	<b>Low (More Preferred)</b>	<b>High (Less Preferred)</b>



**TABLE 4: Avonlough Pressure Sewer Routing from East Side of Moira River to WWTP**

Category & Criteria	Route 1 Dundas/George St.	Route 2 Pinnacle/St. Paul St.	Route 3 Church/St. Paul St.	Route 4 John St. S/St. Paul St.	Route 5 Parallel to CPR Corridor
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>NATURAL ENVIRONMENT</b></p> <p><b>1. Potential effects on terrestrial/aquatic habitat and species.</b></p>	<p><b>Terrestrial Environment</b></p> <ul style="list-style-type: none"> <li>There are no Areas of Natural or Scientific Interest (ANSIs), Provincially or Locally Significant Wetlands (PSWs or LSWs), significant woodlands or environmentally significant areas within 120 m of Route 1.</li> <li>An unevaluated wetland is located within 120 m of Route 1, east of South George St. and south of St. Paul St.</li> <li>A Deciduous Forest (FOD) is located southeast of the rail corridor and South George St. that may be affected if vegetation removal is proposed therein.</li> <li>Two candidate Significant Wildlife Habitat (SWH) could be present within 120 m of the alternative, including habitat for 11 Species of Conservation Concern (SOCC).</li> <li>Wildlife, including bats, Migratory Bird Convention Act, 1994 (MBCA) protected breeding birds and SOCC will be affected by vegetation removal in the FOD via habitat loss and potential displacement or disturbance. Sensitive wildlife restrictive timing for vegetation/tree removal will apply, such as outside of the breeding bird season (April 1 to August 31) and bat active season (March 30 to October 1, if removing trees from FOD).</li> </ul> <p><b>Aquatic Environment</b></p> <ul style="list-style-type: none"> <li>No aquatic effects anticipated. Fish habitat not present.</li> </ul>	<p><b>Terrestrial Environment</b></p> <ul style="list-style-type: none"> <li>There are no ANSIs, PSWs, LSWs, unevaluated wetlands, significant woodlands or environmentally significant areas within 120 m of Route 2.</li> <li>Little to no vegetation communities or wildlife habitats are present. Impacts will be limited to street trees or landscape vegetation.</li> <li>An unevaluated wetland is located within 15-30 m of where the route connects with the WWTP.</li> <li>A Deciduous Forest (FOD) is located southeast of the rail corridor and South George St. that may be affected if vegetation removal is proposed therein.</li> <li>Two candidate SWH could be present within 120 m of the alternative, including habitat for 11 Species of SOCC.</li> <li>Sensitive wildlife restrictive timing for vegetation/tree removal will apply, such as outside of the breeding bird season (April 1 to August 31) and bat active season (March 30 to October 1, if removing trees from FOD).</li> </ul> <p><b>Aquatic Environment</b></p> <ul style="list-style-type: none"> <li>No aquatic effects anticipated. Fish habitat not present.</li> </ul>	<p><b>Terrestrial Environment</b></p> <ul style="list-style-type: none"> <li>There are no ANSIs, PSWs, LSWs, unevaluated wetlands, significant woodlands or environmentally significant areas within 120 m of Route 3.</li> <li>Little to no vegetation communities or wildlife habitats are present. Impacts will be limited to street trees or landscape vegetation.</li> <li>An unevaluated wetland is located within 15-30 m of where the route connects with the WWTP.</li> <li>Two candidate SWH could be present within 120 m of the alternative, including habitat for 11 Species of SOCC.</li> <li>Sensitive wildlife restrictive timing for vegetation/tree removal will apply, such as outside of the breeding bird season (April 1 to August 31) and bat active season (March 30 to October 1, if removing trees from FOD).</li> </ul> <p><b>Aquatic Environment</b></p> <ul style="list-style-type: none"> <li>No aquatic effects anticipated. Fish habitat not present.</li> </ul>	<p><b>Terrestrial Environment</b></p> <ul style="list-style-type: none"> <li>There are no ANSIs, PSWs, LSWs, unevaluated wetlands, significant woodlands or environmentally significant areas within 120 m of Route 4.</li> <li>Little to no vegetation communities or wildlife habitats are present. Impacts will be limited to street trees.</li> <li>An unevaluated wetland is located within 15-30 m of where the route connects with the WWTP.</li> <li>Two candidate SWH could be present within 120 m of the alternative, including habitat for 11 Species of SOCC.</li> <li>Sensitive wildlife restrictive timing for vegetation/tree removal will apply, such as outside of the breeding bird season (April 1 to August 31) and bat active season (March 30 to October 1, if removing trees from FOD).</li> </ul> <p><b>Aquatic Environment</b></p> <ul style="list-style-type: none"> <li>No aquatic effects anticipated. Fish habitat not present.</li> </ul>	<p><b>Terrestrial Environment</b></p> <ul style="list-style-type: none"> <li>There are no ANSIs, PSWs, LSWs, unevaluated wetlands, significant woodlands or environmentally significant areas within 120 m of Route 5.</li> <li>Little to no vegetation communities or wildlife habitats are present. Impacts will be limited to street trees.</li> <li>Two candidate SWH could be present within 120 m of the alternative, including habitat for 11 Species of SOCC.</li> <li>An unevaluated wetland is located within 15-30 m of where the route connects with the WWTP.</li> <li>Sensitive wildlife restrictive timing for vegetation/tree removal will apply, such as outside of the breeding bird season (April 1 to August 31) and bat active season (March 30 to October 1, if removing trees from FOD).</li> </ul> <p><b>Aquatic Environment</b></p> <ul style="list-style-type: none"> <li>No aquatic effects anticipated. Fish habitat not present.</li> </ul>
	<p><b>2. Potential effects on Species at Risk (SAR) and their habitat.</b></p>	<p><b>Terrestrial Environment</b></p> <ul style="list-style-type: none"> <li>The following SAR and their habitat may potentially occur in or within 120 m of the Route 1 based on identified ELC based on aerial photo interpretation: <ul style="list-style-type: none"> <li>Threatened: 4 (Barn Swallow, Bobolink, Chimney Swift and Eastern Meadowlark)</li> <li>Endangered: 6 (Pale-bellied Frost Lichen, Little Brown Myotis, Eastern Small-footed Myotis, Northern Myotis, Tri-colored Bat, and Butternut).</li> </ul> </li> </ul> <p><b>Aquatic Environment</b></p> <ul style="list-style-type: none"> <li>No habitat for aquatic SAR overlapped by Route 1.</li> </ul>	<p><b>Terrestrial Environment</b></p> <ul style="list-style-type: none"> <li>The following SAR and their habitat may potentially occur in or within 120 m of the Route 2 based on identified ELC from aerial photo interpretation: <ul style="list-style-type: none"> <li>Threatened: 4 (Barn Swallow, Bobolink, Chimney Swift and Eastern Meadowlark)</li> <li>Endangered: 1 (Butternut).</li> </ul> </li> </ul> <p><b>Aquatic Environment</b></p> <ul style="list-style-type: none"> <li>No habitat for aquatic SAR overlapped by Route 2.</li> </ul>	<p><b>Terrestrial Environment</b></p> <ul style="list-style-type: none"> <li>The following SAR and their habitat may potentially occur in or within 120 m of the Route 3 based on identified ELC from aerial photo interpretation: <ul style="list-style-type: none"> <li>Threatened: 4 (Barn Swallow, Bobolink, Chimney Swift and Eastern Meadowlark)</li> <li>Endangered: 1 (Butternut).</li> </ul> </li> </ul> <p><b>Aquatic Environment</b></p> <ul style="list-style-type: none"> <li>No habitat for aquatic SAR overlapped by Route 3.</li> </ul>	<p><b>Terrestrial Environment</b></p> <ul style="list-style-type: none"> <li>The following SAR and their habitat may potentially occur in or within 120 m of the Route 4 based on identified ELC based on aerial photo interpretation: <ul style="list-style-type: none"> <li>Threatened: 4 (Barn Swallow, Bobolink, Chimney Swift and Eastern Meadowlark)</li> <li>Endangered: 1 (Butternut).</li> </ul> </li> </ul> <p><b>Aquatic Environment</b></p> <ul style="list-style-type: none"> <li>No habitat for aquatic SAR overlapped by Route 4.</li> </ul>
<p><b>3. Potential effects on surface water including source protection and groundwater.</b></p>	<ul style="list-style-type: none"> <li>Dewatering anticipated.</li> <li>Located within limits of Highly Vulnerable Aquifer.</li> </ul>	<ul style="list-style-type: none"> <li>Dewatering anticipated.</li> <li>Route transects IPZ Z3 (low risk)</li> <li>Located within limits of Highly Vulnerable Aquifer.</li> </ul>	<ul style="list-style-type: none"> <li>Dewatering anticipated.</li> <li>Located within limits of Highly Vulnerable Aquifer.</li> </ul>	<ul style="list-style-type: none"> <li>Dewatering anticipated.</li> <li>Located within limits of Highly Vulnerable Aquifer.</li> </ul>	<ul style="list-style-type: none"> <li>Dewatering anticipated.</li> <li>Located within limits of Highly Vulnerable Aquifer.</li> </ul>
<p><b>4. Potential to encounter soil and water contamination.</b></p>	<ul style="list-style-type: none"> <li>Moderate potential to encounter soil and water contamination.</li> </ul>	<ul style="list-style-type: none"> <li>High potential to encounter soil and water contamination as the route is subject to By-law Number 2020-21.</li> </ul>	<ul style="list-style-type: none"> <li>High potential to encounter soil and water contamination as the route is subject to By-law Number 2020-21.</li> </ul>	<ul style="list-style-type: none"> <li>Moderate potential to encounter soil and water contamination.</li> </ul>	<ul style="list-style-type: none"> <li>High potential to encounter soil and water contamination as the route is subject to By-law Number 2020-21.</li> </ul>

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<b>Category &amp; Criteria</b>		<b>Route 1</b> Dundas/George St.	<b>Route 2</b> Pinnacle/St. Paul St.	<b>Route 3</b> Church/St. Paul St.	<b>Route 4</b> John St. S/St. Paul St.	<b>Route 5</b> Parallel to CPR Corridor
<b>NATURAL ENVIRONMENT</b>	<b>5. Anticipated environmental permitting and approval considerations.</b>	<ul style="list-style-type: none"> <li>▪ Permit/Authorization or Registration under the ESA may be required for potential SAR identified above (See Criteria 2).</li> <li>▪ Groundwater – dewatering and/or depressurization requirements and anticipated water flow volumes will be confirmed by geotechnical investigations completed in support of detailed design. The determination of which process should be followed (Permit to Take Water (PTTW) or Environmental Activity Sector Registry (EASR)) is based on the expected volume of taking during dewatering; takings between 50,000 L/d and 400,000 L/d are required to register for the EASR while takings above 400,000 L/d are regulated by the PTTW process. If significant dewatering is anticipated, a detailed groundwater management and monitoring plan will be required in support of the dewatering activities.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Permit/Authorization or Registration under the ESA may be required for potential SAR identified above (See Criteria 2). Equivalent to Routes 3 and 4 based on SAR.</li> <li>▪ Groundwater – dewatering and/or depressurization requirements and anticipated water flow volumes will be confirmed by geotechnical investigations completed in support of detailed design. The determination of which process should be followed (Permit to Take Water (PTTW) or Environmental Activity Sector Registry (EASR)) is based on the expected volume of taking during dewatering; takings between 50,000 L/d and 400,000 L/d are required to register for the EASR while takings above 400,000 L/d are regulated by the PTTW process. If significant dewatering is anticipated, a detailed groundwater management and monitoring plan will be required in support of the dewatering activities.</li> <li>▪ Route is subject to By-law Number 2020-21. Risk Management Measures required.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Permit/Authorization or Registration under the ESA may be required for potential SAR identified above (See Criteria 2). Equivalent to Routes 2 and 4 based on SAR.</li> <li>▪ Groundwater – dewatering and/or depressurization requirements and anticipated water flow volumes will be confirmed by geotechnical investigations completed in support of detailed design. The determination of which process should be followed (Permit to Take Water (PTTW) or Environmental Activity Sector Registry (EASR)) is based on the expected volume of taking during dewatering; takings between 50,000 L/d and 400,000 L/d are required to register for the EASR while takings above 400,000 L/d are regulated by the PTTW process. If significant dewatering is anticipated, a detailed groundwater management and monitoring plan will be required in support of the dewatering activities.</li> <li>▪ Route is subject to By-law Number 2020-21. Risk Management Measures required.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Permit/Authorization or Registration under the ESA may be required for potential SAR identified above (See Criteria 2). Equivalent to Routes 2 and 3 based on SAR.</li> <li>▪ Groundwater – dewatering and/or depressurization requirements and anticipated water flow volumes will be confirmed by geotechnical investigations completed in support of detailed design. The determination of which process should be followed (Permit to Take Water (PTTW) or Environmental Activity Sector Registry (EASR)) is based on the expected volume of taking during dewatering; takings between 50,000 L/d and 400,000 L/d are required to register for the EASR while takings above 400,000 L/d are regulated by the PTTW process. If significant dewatering is anticipated, a detailed groundwater management and monitoring plan will be required in support of the dewatering activities.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Permit/Authorization or Registration under the ESA may be required for potential SAR identified above (See Criteria 2).</li> <li>▪ Groundwater – dewatering and/or depressurization requirements and anticipated water flow volumes will be confirmed by geotechnical investigations completed in support of detailed design. The determination of which process should be followed (Permit to Take Water (PTTW) or Environmental Activity Sector Registry (EASR)) is based on the expected volume of taking during dewatering; takings between 50,000 L/d and 400,000 L/d are required to register for the EASR while takings above 400,000 L/d are regulated by the PTTW process. If significant dewatering is anticipated, a detailed groundwater management and monitoring plan will be required in support of the dewatering activities.</li> <li>▪ Route is subject to By-law Number 2020-21. Risk Management Measures required.</li> </ul>
	<b>Natural Environment Potential Constraint Ranking</b>	<b>Medium (Moderately Preferred)</b>	<b>High (Less Preferred)</b>	<b>High (Less Preferred)</b>	<b>Low (More Preferred)</b>	<b>High (Less Preferred)</b>

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<b>Category &amp; Criteria</b>		<b>Route 1</b> Dundas/George St.	<b>Route 2</b> Pinnacle/St. Paul St.	<b>Route 3</b> Church/St. Paul St.	<b>Route 4</b> John St. S/St. Paul St.	<b>Route 5</b> Parallel to CPR Corridor
<b>SOCIO-ECONOMIC ENVIRONMENT</b>	<b>1. Potential effects related to the enjoyment and use of property including disruption to residences, institutions, businesses, recreational facilities during construction (noise, vibration, dust, access).</b>	<ul style="list-style-type: none"> <li>• Moderate impact to community access.</li> <li>• Potential access restrictions to the former Belleville Police Services Centre.</li> <li>▪ Moderate dust generation.</li> <li>▪ Moderate vibration.</li> <li>▪ High noise anticipated (open cut).</li> </ul>	<ul style="list-style-type: none"> <li>▪ Moderate impact to community access.</li> <li>▪ High dust generation (full road construction).</li> <li>▪ Moderate to high vibration.</li> <li>▪ High noise anticipated (open cut).</li> </ul>	<ul style="list-style-type: none"> <li>▪ Moderate impact to community access.</li> <li>▪ High dust generation (full road construction).</li> <li>▪ Moderate to high vibration.</li> <li>▪ High noise anticipated (open cut).</li> </ul>	<ul style="list-style-type: none"> <li>▪ Moderate impact to community access.</li> <li>▪ High dust generation (full road construction).</li> <li>▪ Moderate to high vibration.</li> <li>▪ High noise anticipated (open cut).</li> </ul>	<ul style="list-style-type: none"> <li>▪ Minimal impact to community access.</li> <li>▪ Minimal dust generation.</li> <li>▪ Moderate vibration.</li> <li>▪ Localized moderate to high noise anticipated (directional drilling).</li> </ul>
	<b>Socio-economic Environment Potential Constraint Ranking</b>	<b>Medium (Moderately Preferred)</b>	<b>Medium (Moderately Preferred)</b>	<b>Medium (Moderately Preferred)</b>	<b>Medium (Moderately Preferred)</b>	<b>Low (More Preferred)</b>

**TABLE 4: Avonlough Pressure Sewer Routing from East Side of Moira River to WWTP**

<b>Category &amp; Criteria</b>		<b>Route 1</b> Dundas/George St.	<b>Route 2</b> Pinnacle/St. Paul St.	<b>Route 3</b> Church/St. Paul St.	<b>Route 4</b> John St. S/St. Paul St.	<b>Route 5</b> Parallel to CPR Corridor
<b>CULTURAL ENVIRONMENT</b>	<b>1. Potential effects on archaeological resources.</b>	<ul style="list-style-type: none"> <li>▪ Low potential – route is within the disturbed right-of-way.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Low potential – route is within the disturbed right-of-way</li> </ul>	<ul style="list-style-type: none"> <li>▪ Low potential – route is within the disturbed right-of-way.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Low potential – route is within the disturbed right-of-way</li> </ul>	<ul style="list-style-type: none"> <li>▪ Higher potential compared to other routes – Route 5 includes a segment of sewer within the partially undisturbed corridor that would trigger a Stage 2 archaeological assessment.</li> </ul>
	<b>2. Potential for disruption of built heritage resources.</b>	<ul style="list-style-type: none"> <li>• Route is within the road right-of-way with known designated heritage properties. Potential for indirect impacts (e.g. vibration).</li> </ul>	<ul style="list-style-type: none"> <li>• Route is within the road right-of-way with known designated heritage properties. Potential for indirect impacts (e.g. vibration).</li> </ul>	<ul style="list-style-type: none"> <li>▪ Route is within the road right-of-way with known designated heritage properties. Potential for indirect impacts (e.g. vibration).</li> </ul>	<ul style="list-style-type: none"> <li>▪ Route is within the road right-of-way with known designated heritage properties. Potential for indirect impacts (e.g. vibration).</li> </ul>	<ul style="list-style-type: none"> <li>▪ Route is parallel to the CPR corridor and within the road right-of-way with known designated property. Potential for indirect impacts (e.g. vibration).</li> </ul>
	<b>Cultural Environment Potential Constraint Ranking</b>	<b>Medium (Moderately Preferred)</b>	<b>Medium (Moderately Preferred)</b>	<b>Medium (Moderately Preferred)</b>	<b>Medium (Moderately Preferred)</b>	<b>Medium (Moderately Preferred)</b>

**TABLE 4: Avonlough Pressure Sewer Routing from East Side of Moira River to WWTP**

<b>Category &amp; Criteria</b>		<b>Route 1</b> Dundas/George St.	<b>Route 2</b> Pinnacle/St. Paul St.	<b>Route 3</b> Church/St. Paul St.	<b>Route 4</b> John St. S/St. Paul St.	<b>Route 5</b> Parallel to CPR Corridor
<b>COST</b>	<b>1. Cost of construction (including property acquisition).</b>	<ul style="list-style-type: none"> <li>▪ Pressure Sewer Length 1,084 m (from Dundas/Pinnacle to WWTP) \$3.7M.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Pressure Sewer Length 1,084 m (from Dundas/Pinnacle to WWTP) \$3.6M</li> <li>▪ Potentially significantly higher costs to deal with contaminated soil/groundwater (City Health and Safety By-law Number 2020-21).</li> </ul>	<ul style="list-style-type: none"> <li>▪ Pressure Sewer Length 1,074 m (from Dundas/Pinnacle to WWTP) \$3.6M</li> <li>▪ Potentially significantly higher costs to deal with contaminated soil/groundwater (City Health and Safety By-law Number 2020-21).</li> </ul>	<ul style="list-style-type: none"> <li>▪ Pressure Sewer Length 1,094 m (from Dundas/Pinnacle to WWTP) \$3.6M</li> </ul>	<ul style="list-style-type: none"> <li>▪ CPR Flagging. \$100K.</li> <li>▪ Pressure Sewer Length 1,006 m (from Dundas/Pinnacle to WWTP) \$3.3M.</li> <li>▪ Potentially significantly higher costs to deal with contaminated soil/groundwater (City Health and Safety By-law Number 2020-21).</li> </ul>
	<b>2. Cost of operations / maintenance.</b>	<ul style="list-style-type: none"> <li>▪ No significant discriminator.</li> </ul>	<ul style="list-style-type: none"> <li>▪ No significant discriminator.</li> </ul>	<ul style="list-style-type: none"> <li>▪ No significant discriminator.</li> </ul>	<ul style="list-style-type: none"> <li>▪ No significant discriminator.</li> </ul>	<ul style="list-style-type: none"> <li>▪ No significant discriminator.</li> </ul>
	<b>Cost Potential Constraint Ranking</b>	<b>Low (More Preferred)</b>	<b>High (Less Preferred)</b>	<b>High (Less Preferred)</b>	<b>Low (More Preferred)</b>	<b>High (Less Preferred)</b>

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## Table 4: Summary of Evaluation

The table below provides a summary version of the detailed evaluation presented above. Route 4 has the lowest overall potential constraints relative to the other routes.

Category	Route 1	Route 2	Route 3	Route 4	Route 5
<b>Land Use</b>	Low (More Preferred)	Medium (Moderately Preferred)	Medium (Moderately Preferred)	Low (More Preferred)	High (Less Preferred)
<b>Technical</b>	Medium (Moderately Preferred)	High (Less Preferred)	High (Less Preferred)	Low (More Preferred)	High (Less Preferred)
<b>Natural Environment</b>	Medium (Moderately Preferred)	High (Less Preferred)	High (Less Preferred)	Low (More Preferred)	High (Less Preferred)
<b>Socio-Economic Environment</b>	Medium (Moderately Preferred)	Medium (Moderately Preferred)	Medium (Moderately Preferred)	Medium (Moderately Preferred)	Low (More Preferred)
<b>Cultural Environment</b>	Medium (Moderately Preferred)	Medium (Moderately Preferred)	Medium (Moderately Preferred)	Medium (Moderately Preferred)	Medium (Moderately Preferred)
<b>Cost</b>	Low (More Preferred)	High (Less Preferred)	High (Less Preferred)	Low (More Preferred)	High (Less Preferred)
<b>Pressure Sewer Routing Evaluation - Overall Potential Constraint Ranking</b>	Medium (Moderately Preferred Route)	Medium (Moderately Preferred Route)	Medium (Moderately Preferred Route)	<b>Low (More Preferred Route)</b>	High (Less Preferred Route)